

P.1.8 CLIMATE CHANGE ILLUSTRATED BY DATA FROM THREE INDIAN OCEAN ISLANDS IN THE FRENCH SOUTHERN AND ANTARCTIC TERRITORIES: NEW AMSTERDAM, KERGUELEN, AND CROZET

Harvey Stern¹, John Cornall-Reilly¹, Patrizia McBride¹, and James Dahni²

¹Bureau of Meteorology, Australia

²Melbourne High School, Australia

1. INTRODUCTION

1.1 Location

The *French Southern and Antarctic Territories* comprise an overseas territory consisting of various islands in the south Indian Ocean, as well as the Adélie Coast on the Antarctic continent.

These territories were linked for administrative purposes with Madagascar from 1924 until 1955, when they became a French territory governed under a special statute by a senior administrator who is partially resident in Paris.

It was not until the arrival of scientific personnel in 1949–50 that they were effectively occupied.

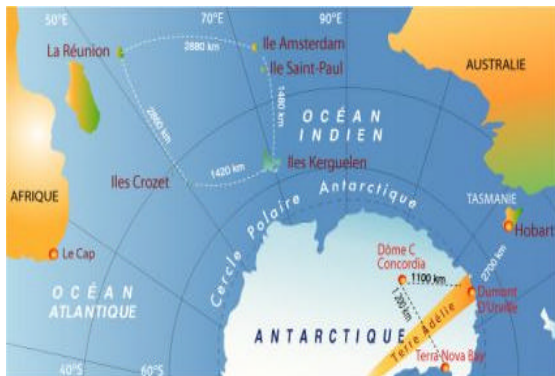


Figure 1 Location map

Source: <http://pinniped.free.fr/Ams.htm>

2. ANALYSIS

2.1 Purpose

French scientists use weather and other research stations on the islands.

It is the purpose of this paper to report upon what the weather data from the three islands, New Amsterdam, Kerguelen, and Crozet, add to our knowledge about global climate change.

2.2 Data source

The weather data analysed herein comprises nearly sixty years (from the early 1950s to 2008) of minimum temperature, maximum temperature, and precipitation data from New Amsterdam and Kerguelen Islands, and over thirty years (from the mid-1970s to 2008) of minimum temperature, maximum temperature, and precipitation data from the Crozet Islands.

Gilbert Gayraud of METEO-FRANCE provided the data set, and the authors are grateful to Noel Davidson and Maree-Dominique Leroux for expediting its provision.

3. NEW AMSTERDAM



Figure 2 New Amsterdam

Source:

http://www.btinternet.com/~sa_sa/amsterdam/amsterdam_history_early.html

*Corresponding author address: Dr. Harvey Stern, Bureau of Meteorology, Box 1636, Melbourne, Vic., 3001, Australia; e-mail: h.stern@bom.gov.au

Temperature data from New Amsterdam (38°S 78°E) shows an upward trend from the 1950s, when minimum temperatures averaged 11.3°C and maximum temperatures averaged 15.8°C, to recent

years, which have seen minimum temperatures averaging 11.9°C and maximum temperatures averaging 16.8°C.

Precipitation data suggests that the island has become slightly drier, annual totals declining from about 1130 mm in the 1950s, to about 1080 mm in recent years.

4. KERGUELEN



Figure 3 Kerguelen

Source:

<http://www.siec.k12.in.us/west/proj/penguins/subislands.html>

As with New Amsterdam, temperature data from Kerguelen (49°S 70°E) also shows an upward trend from the 1950s, when minimum temperatures averaged 1.2°C and maximum temperatures averaged 7.6°C, to recent years, which have seen minimum temperatures averaging 1.9°C and maximum temperatures averaging 8.5°C.

The trend in precipitation amount appears to be downward, but this trend is not conclusive on account of considerable year-to-year variability.

5. CROZET



Figure 4 Crozet

Source:

<http://www.siec.k12.in.us/west/proj/penguins/subislands.html>

Temperature data from Crozet (46°S 52°E) shows an upward trend from the 1970s, when minimum temperatures averaged 2.4°C and maximum temperatures averaged 8.2°C, to recent years, which have seen minimum temperatures averaging 2.7°C and maximum temperatures averaging 8.4°C.

As with Kerguelen, the trend in precipitation amount appears to be downward, but this trend is not conclusive on account of considerable year-to-year variability.

6. CONCLUSION

To summarise, weather data from the three Indian Ocean islands suggest that there has been an upward trend in temperature, and a downward trend in precipitation amount. However, one is less confident about the downward trend in precipitation amount, on account of considerable year-to-year variability in that parameter.