

Weather on Macquarie Island or Whatever it is, it's Wet!

One of the key factors influencing the commercial development of Macquarie Island in the nineteenth and early twentieth centuries was the weather! It was and still is the one uncontrollable element that often determines what can be done on the island.



West coast of Macquarie Island. Photo: Geof Copson

The severe storms which pass over and around the island have tended to keep humans being away from this isolated spot in the Southern Ocean and deterred them from completely ruining many of its natural features. The flora and fauna of the island have learned to adapt to such arduous conditions without any external aids and happily survive as long as humans keep their distance.

But what are the meteorological conditions that prevail on the island? In Table 1 are the facts and figures which show statistically the average weather conditions for the past fifty two years. However, visitors to the island always hold the view that these figures do not give a true picture of the real day to day weather that is experienced by park rangers, scientists and technicians who carry out research there. The dense fogs, the soaking mists, the howling winds, the pounding seas, the extreme chill factor, the difficult terrain and the smell all disappear when these statistics are studied.

Observers on the island are busy every day collecting the data that goes toward making up the statistical data shown in the table. Temperature, wind speed, atmospheric pressure and sunshine are continually recorded while other information such as rainfall and cloud cover are recorded every six hours.

In addition, the 'Island Met. Crew' send up special balloons with instruments attached, called radiosondes, which read and send back to the station information about the atmospheric conditions above the island.

As Ms. Ashleigh Wilson, the Meteorologist at Macquarie Island in March 2000, explains:

“The photograph shows a balloon and two radiosondes; the smaller of the two boxes is the Vaisala Radiosonde which records air pressure, temperature and humidity as it ascends through the atmosphere and these are released every 12 hours. The larger box is an ozone radiosonde that measures the amount of ozone in the atmosphere that it is passing through, and these are released once a week.

The balloon is inflated with enough hydrogen to make it ascend at 300 meters per minute. Each balloon flight lasts 1_ to 2 hours and reaches a height of up to 37.5 kilometres. The bigger box of ozone instruments, which cost \$900 each, can be reused if it is recovered, but as there is sea in all directions from Macquarie Island the chance of a recovery are very small.



**Releasing radiosonde balloons.
Photo: A. Wilson**

A Geographical Positioning System (GPS) navigation unit inside the box is used to continually measure the balloon’s position as it rises. From this information the wind speed and direction are calculated for various heights above the ground. The ozone radiosonde is one of the special meteorological programmes being run at Macquarie Island.

The data is relayed from the radiosondes to the ground station here in the office where it is received on a special set. It is then transferred to a computer where I can view graphical charts of the pressure, temperature, humidity, wind speed and direction as the balloon ascends.



View from the office window.

Photo: A Wilson

I convert the atmospheric information into internationally recognised code and send it to Hobart, who send it on to Melbourne and other centres world wide. Similar data is taken at exactly the same time from hundreds of other observation sites around the globe, and all this information can be combined to give an very precise view of world wide weather patterns twice every day.

The combined results are then used to compile weather forecasts for everyone, including aircraft and shipping.”

Macquarie Island meteorological data is also being used in a world-wide network to monitor possible Global Warming. Long term weather observations from such isolated places are extremely valuable as they are unaffected by the building of cities, industrial development, environmental pollution and changes in vegetation due to farming or logging. Observations made here can therefore more readily detect any possible long term trends in climate change.

The ability to assess the long term trends in the worlds climate will depend on a very careful analysis of all the characteristics of the records from many locations around the world and take into account the natural variability and complexity of global weather patterns which are not yet fully understood.

Glyn Roberts
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