

Overview – automatic weather stations

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David began working with automatic weather stations in the early 1980s, starting with the monitoring of intensive livestock housing for NSW DPI and then branching into monitoring agricultural and horticultural trials. He has extensive experience with a variety of equipment and sensors together with the quality control aspects of the equipment and data. Since retiring from NSW DPI in 2013 he is working with the Bureau of Meteorology evaluating an automated evaporation measurement system to complement their automatic weather stations.

Automatic weather stations (AWSs) can be very simple or very sophisticated. The nature of the AWS system that you choose for your viticulture application will depend on:

- » the aspects of the vineyard climate/ microclimate that you want to monitor
- » how many sites you want to monitor
- » how you want to get the data back to your office
- » whether you want to be notified of particular events occurring
- » the budget available.

The basics of an AWS system are a controller (a datalogger or 'black box'), an array of sensors to measure various climatic parameters, a power source (e.g. mains, or solar and battery) and a communication component (commonly known as 'comms').



MEA junior weather station



MET200 meteorological system

Entry level equipment which is available via the internet or through assorted retail shops generally have a range of sensors to cover air temperature, humidity, rainfall, and some aspects of wind. They usually have the facility to monitor outside conditions and use wireless to send the information (data) a limited distance back to a house/office.

The controller and the sensors of the more sophisticated equipment generally provide more versatility in the measurement of climate parameters both in number, variety, and in the accuracy of the data collected. Commonly they also are able to provide 'virtual' data in the form of calculations relating to single sensors e.g. temperature, or to multiple sensors e.g. disease warnings relating to wetness duration together with temperature, or humidity and temperature etc. Entry level equipment is usually not able to do this, although, if the appropriate sensors are available, such calculations can be done manually in a spreadsheet.

Where the sophisticated equipment really comes into its own however is in the area of comms. These systems can be fitted with a modem or router (which operates in conjunction with a SIM) and data can be downloaded from the AWS system remotely. In addition the system can itself send an SMS or email to a designated recipient either on a regular basis or when conditions leading to a disease or other alert are met. This provides a warning to the user that particular conditions have been met. The other possibilities – extra possibilities – are for the AWS equipment supplier to provide services in

the form of data hosting so that your information is available via password from their website or another option is to have them create a website for you.

A word at this point about the rationale of monitoring. If the area of the vineyard is only small it would normally only require one AWS system. However if the area to be monitored is large, elongated, undulating etc. then consideration should be given to monitoring at multiple sites. It is normally considered that a better picture of the prevailing climate comes from measuring at a number of sites. Accuracy of measurement is all very well but if the conditions vary across the vineyard (e.g. rain showers and therefore leaf wetness can vary widely) then it is best to be aware of, understand and respond to that variation. Likewise variation is particularly relevant with frost susceptibility on undulating sites.

The following listing of available equipment does not cover the simpler retail or internet sources of AWS equipment. That can be found using normal internet searching.

The more sophisticated AWSs are generally put together by the manufacturers/suppliers in accordance with your needs. For fairness, they have been arranged in alphabetical order rather than price or sophistication order. Each of those listed has sensors available to measure both normal climate parameters and less common parameters. Suppliers will provide software and usually program the system in accordance with your needs. With some experience of the system and programming you will be able to modify the program and add sensors.

The list does not claim to cover all the available suppliers. Similarly no attempt has been made to cost the systems because of the wide choice of controllers and sensors that can be used.

Campbell Scientific, based in Townsville, Qld
www.campbellsci.com.au p: 07 4401 7700

Campbell can provide a complete package in accordance with requirements.

We pride ourselves on providing data acquisition and measurement and control systems that are customized to meet exact needs. We've configured systems for a variety of applications using our product line of data loggers, sensors, and peripherals. One of these systems may fit your needs, or it can serve as a starting point for customizing your system.

DataTaker/Thermofisher, based in Melbourne, Vic
www.datataker.com p: 03 9757 4477

DataTaker manufactures the datalogger/controller but complete system packages are available through a number of distributors

www.datataker.com/distributors.php#ausnz

We supply to a broad range of customers across many industries including environmental, industrial, construction, manufacturing, process management, scientific, laboratory and education. Our data loggers are designed to be compatible with almost all types

of sensors, with a strong focus on communications to make your data easily accessible. If you have any trouble finding exactly what you need on this website please feel free to contact us we would be pleased to assist!

Enviromdata, based in Warwick, Qld
www.enviromdata.com.au p: 07 4661 4699

Complete packages with particular emphasis on simplifying access to your data via 'WeatherMation'

Enviromdata has built its reputation on providing quality, professional, scientific and industrial weather stations and backing it up with the highest level of support all its customers, for the life of their equipment. Customers are seen as long term partners, and it is this long-term commitment by Enviromdata that has ensured that customers return. Your weather station can also be customised to include a wide range of specialised third party weather sensors. These can be sourced from any instrument manufacturer worldwide.

Measurement Engineering Australia, based in Magill, SA
www.me.com.au p: 08 8332 9044

Extensive experience with viticultural systems.

We're based in Adelaide, South Australia and were founded in 1984 by our ever-committed Engineering Director, Andrew Skinner. We bring soil moisture monitoring, renewable energy and plant science technologies to your business, with a view to turning art into science. Throughout the past 25+ years, we've worked with people just like you in every sector of the agricultural industry. While doing this, we've also poked and probed most corners of our wide, brown land.

We design and manufacture environmental monitoring systems. And we turn data into information – information that you can use to minimise cost and time spent on guesswork or re-work. Our objective is to deploy systems that maximise your efficiency, crop yields and profit.

And finally some words for when you're thinking beyond the initial purchase.

Support: Is the product readily supported?

Maintenance: Irrespective of whether you are thinking about the entry level equipment or the higher quality equipment discussed in more detail in this article, all will require maintenance to continue to give accurate and realistic data. This includes your own time in keeping the various components clean and 'unobstructed'.

Accuracy: There is no point in having a highly accurate sensor if tendrils, spider webs, dust, ants or other gremlins start interfering with its performance. Rain gauges can be blocked giving the impression that there has been no rain! Consideration should be given to re-calibration at recommended intervals since even the best sensors and equipment are subject to drift over time.