



# **Appendix A**

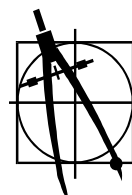
## **Yoncalla Reference Site Data**

**Parent Report:**

**Stream Temperature and Climate in the Calapooya Watershed**

**12/12/2003**

**An Umpqua Basin Watershed Council  
Water Quality Report**



**InSight Consultants**  
Yoncalla, OR  
[www.yoncalla.net](http://www.yoncalla.net)

## Appendix A Yoncalla Bucket Study

A supplemental study was conducted to provide a control site to compare temperature conditions with the study data and to estimate the evaporation rate and determine the  $Q_E$  component by direct measurement.

A total of seven data loggers were deployed in three general areas.

Area 1 was a pail of water fully exposed to the sun. One data logger was deployed in the water one inch above the bottom of the pail. The second unit was suspended in the air above the water, level with the top edge of the pail.

Area 2 had a similar arrangement but the pail was shaded by a table with plastic sheeting over the south (to the right) and west sides. A third data logger was placed on the top of the table.

Area 3 was in the interior portion of the shrubbery area to represent a shrub-vegetated environment. One data logger was suspended in the shaded branches about six feet above the ground and a second unit was placed directly on the shaded ground.

The water level in both pails was measured periodically over the course of the summer to establish the evaporation rate for the shaded and unshaded conditions.



Picture 1 Supplemental Study Layout.



Picture 3 Area 1 close up.



Picture 3 Area 2 close up.

## Evaporation Study

Tables 1-3 show the data used to estimate the local evaporation rates.

**Table 1 Sun Bucket data**

Sun Bucket Data							rate of loss
Test Date	Depth inch	water dia	mean dia	Volume cf	Vol Evapor	Inches Lost	cf/day
6/26/2003	11.25	11.03716	10.58108	0.572478	0	0	
7/5/2003	8.75	10.83446	10.47973	0.436772	0.1357064	2.5	0.01501476
7/16/2003	5.75	10.59122	10.35811	0.280398	0.29208	5.5	0.01421578
7/26/2003	2.625	10.33784	10.23142	0.124896	0.4475823	8.625	0.01555024 use
8/4/2003	0.25	10.14527	10.13514	0.011672	0.5608059	11	0.01203262 0.01524
8/4/2003	11.25	11.03716	10.58108	0.572478	0	0	
8/19/2003	6.75	10.6723	10.39865	0.331744	0.2407334	4.5	0.01618376
9/7/2003	2.25	10.30743	10.21622	0.106735	0.4657425	9	0.01181667

**Table 2 Shade bucket data**

Shade Bucket Data							rate of loss
Depth inch	water dia	mean dia	Volume cf	Vol Evapor	Inches Los	cf/day	
11.25	11.03716	10.58108	0.572477932	0	0		
10.125	10.94595	10.53547	0.510798072	0.06168	1.125	0.006824	
8.75	10.83446	10.47973	0.436771569	0.135706	2.5	0.00673	
7.25	10.71284	10.41892	0.35770867	0.214769	4	0.007906 use	
6.25	10.63176	10.37838	0.305974449	0.266503	5	0.005498 0.0072	
11.25	11.03716	10.58108	0.572477932	0	0		
9.25	10.875	10.5	0.463517861	0.10896	2	0.007325	
6.75	10.6723	10.39865	0.331744495	0.240733	4.5	0.00692	

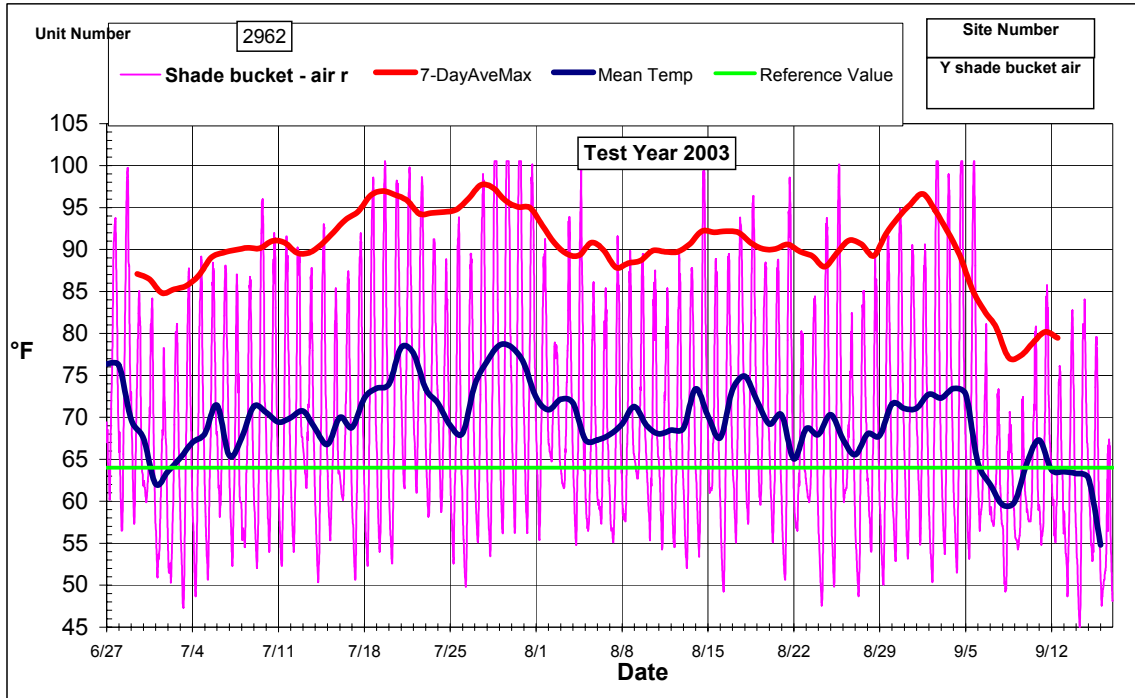
**Table 3 Rate Calculations**

	Inches/day	m/day	mm/day	kg/sqm/day	MJ/sqm/day	average daily power watts/sqm
Sun rate	0.28	0.007082	7.082411	7.040625	17.270653	199.8918172
Shade rate	0.13	0.003219	3.219278	3.200284	7.8502968	90.85991691

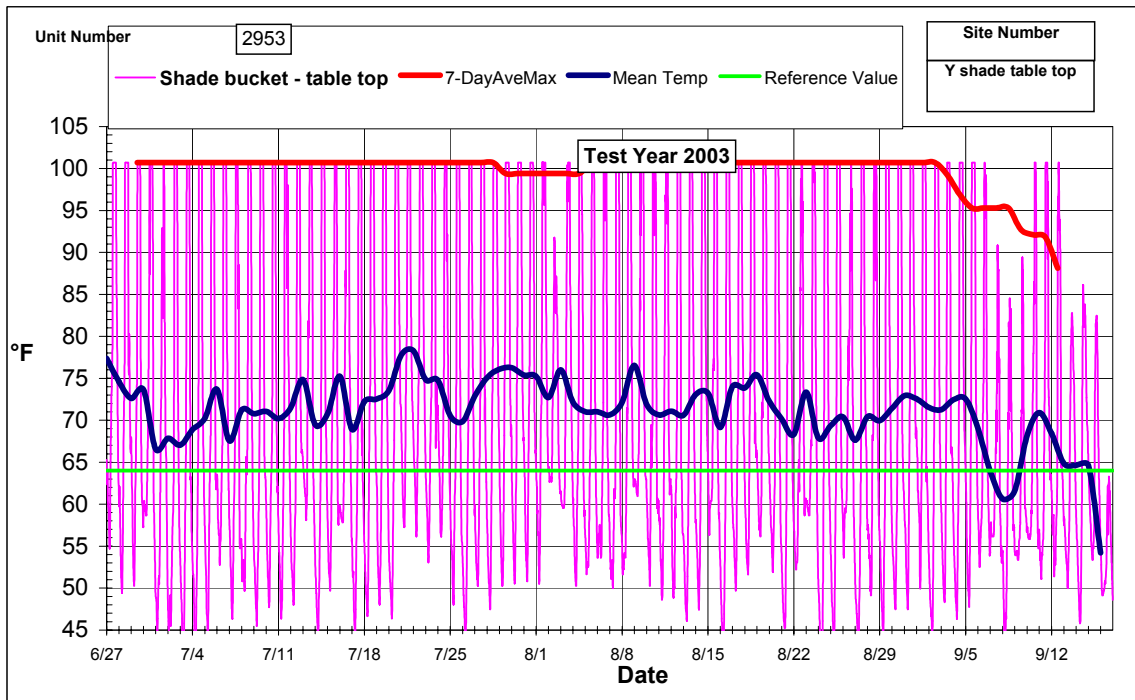
## Temperature data

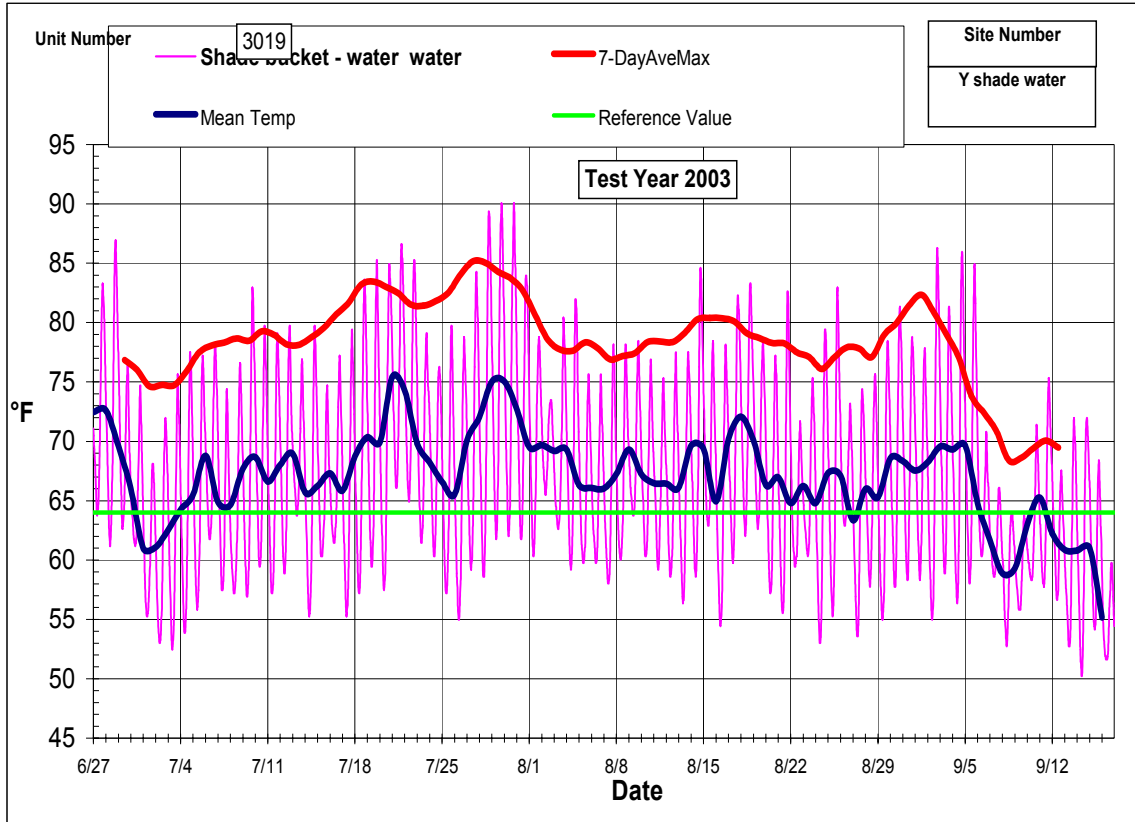
The following charts show the data that was obtained from the study. Note that the temperature of the units measuring exposed air frequently exceeded the 100 °F maximum limit of the data logger. Consequently, calculated mean and 7-day average values are not valid during the high temperature conditions. However, the data is valid on the cooler days and may have some value for analysis.

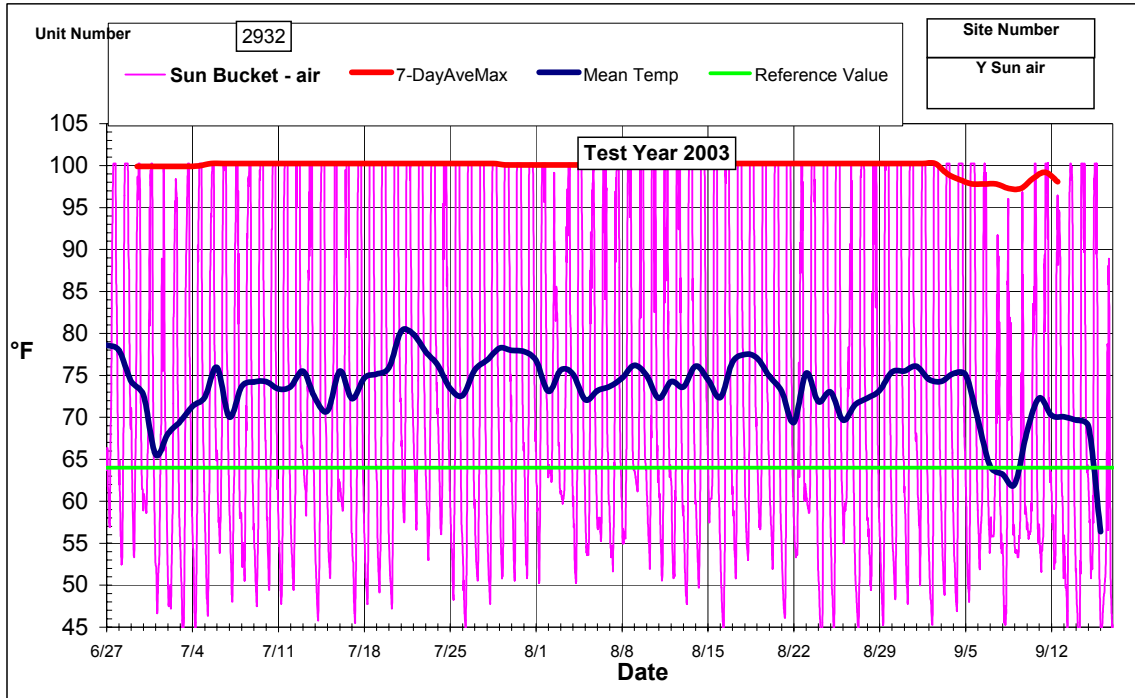
The data files are available upon request.



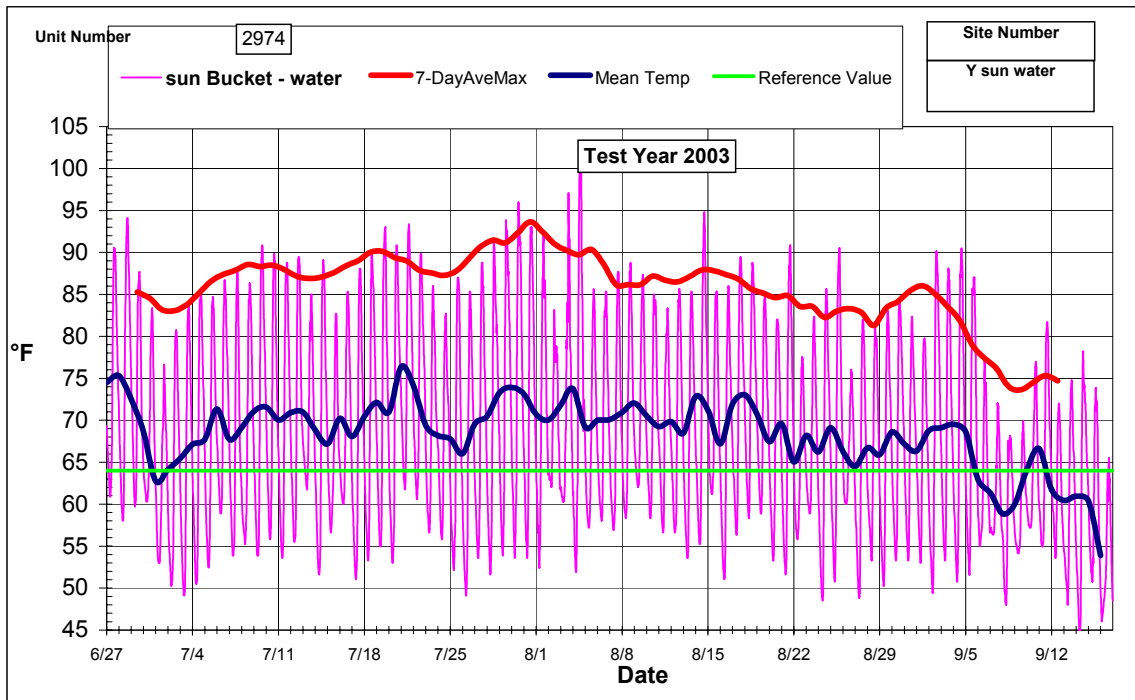
Note: 100 °F limit exceeded - mean value not valid when exceeded.

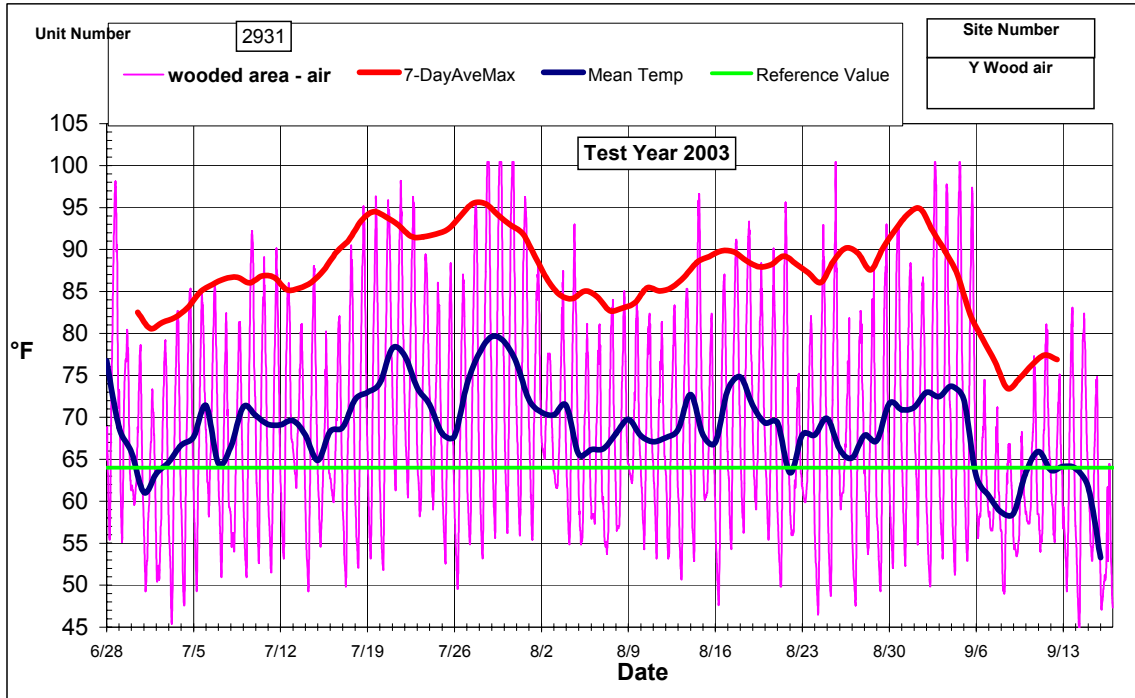






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