

**Draft: Bone Lake, Polk County (WBIC 2628100),  
Dipotassium Salt of Endothall Herbicide Concentration Monitoring Summary, 2014**

**28 November 2014**

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Bone Lake is listed as a eutrophic, drainage lake on the WI DNR web site. The lake has an area of 1667 acres, maximum depth of 43 ft and a mean depth of 23 ft. On 28 and 29 May 2014, 10 areas on bone Lake were treated with a liquid formulation of dipotassium salt of endothall (endothall) applied as Aquathol K to control curly-leaf pondweed (*Potamogeton crispus*) (Figure 1) (Chemical Aquatic Plant Control Permit Application and Aquatic Plant Management Herbicide Treatment Record). The target concentration (application rate) was 2.0 mg/L active ingredient (ai). Water sample sites were established at 5 locations to monitor endothall concentrations and exposure times (Figure 2).

<b>Treatment Site</b>	<b>Treatment Area, acres</b>	<b>Herbicide Sample Sites</b>	<b>Treatment Date</b>
B2	2.53	none	5/29/2014
B3	2.2	none	5/28/2014
B4	4.4	none	5/28/2014
B5	3.26	B5	5/29/2014
B6A	3.17	B6 A	5/29/2014
B6B	3.32	B6 B	5/29/2014
B6C	2.44	none	5/29/2014
B7A	0.94	none	5/28/2014
B7B	4.86	B7	5/28/2014
B8	4.1	B8	5/28/2014

The water temperature at the time of herbicide application was reported in the Aquatic Plant Management Herbicide Treatment Record to be 60 to 62°F (15.6 to 16.7°C). The wind was reported to be 1 to 5 mph from the E, SE. Wind speed and direction was reported to be 0 to 5 mph from the S, SE by volunteer water sample collectors. Weather data for Cumberland, WI ([www.wunderground.com](http://www.wunderground.com)) indicated that wind velocity was 0 to 8 mph beginning from the south and changing to the north on 28 May (Appendix). Winds then shifted to the south or were calm on 29 May.

Water samples were collected using an integrated water sampler which collects a water sample from the entire water column. Water samples were collected from sample sites at time intervals of approximately 1, 3, 6, 9, 18, and 24 hours after treatment (HAT). Depending on time of herbicide application some sample intervals were omitted due to darkness. Water samples were taken to shore after completion of each sample interval, and 3 drops of sulfuric acid were added to each sample bottle to fix the herbicide and prevent degradation. Samples were then stored in a refrigerator, until shipped to the State Laboratory of Hygiene (SLOH), Madison, WI for analysis of endothall. Endothall application rates are based on mg/L active ingredient (ai), while endothall concentrations

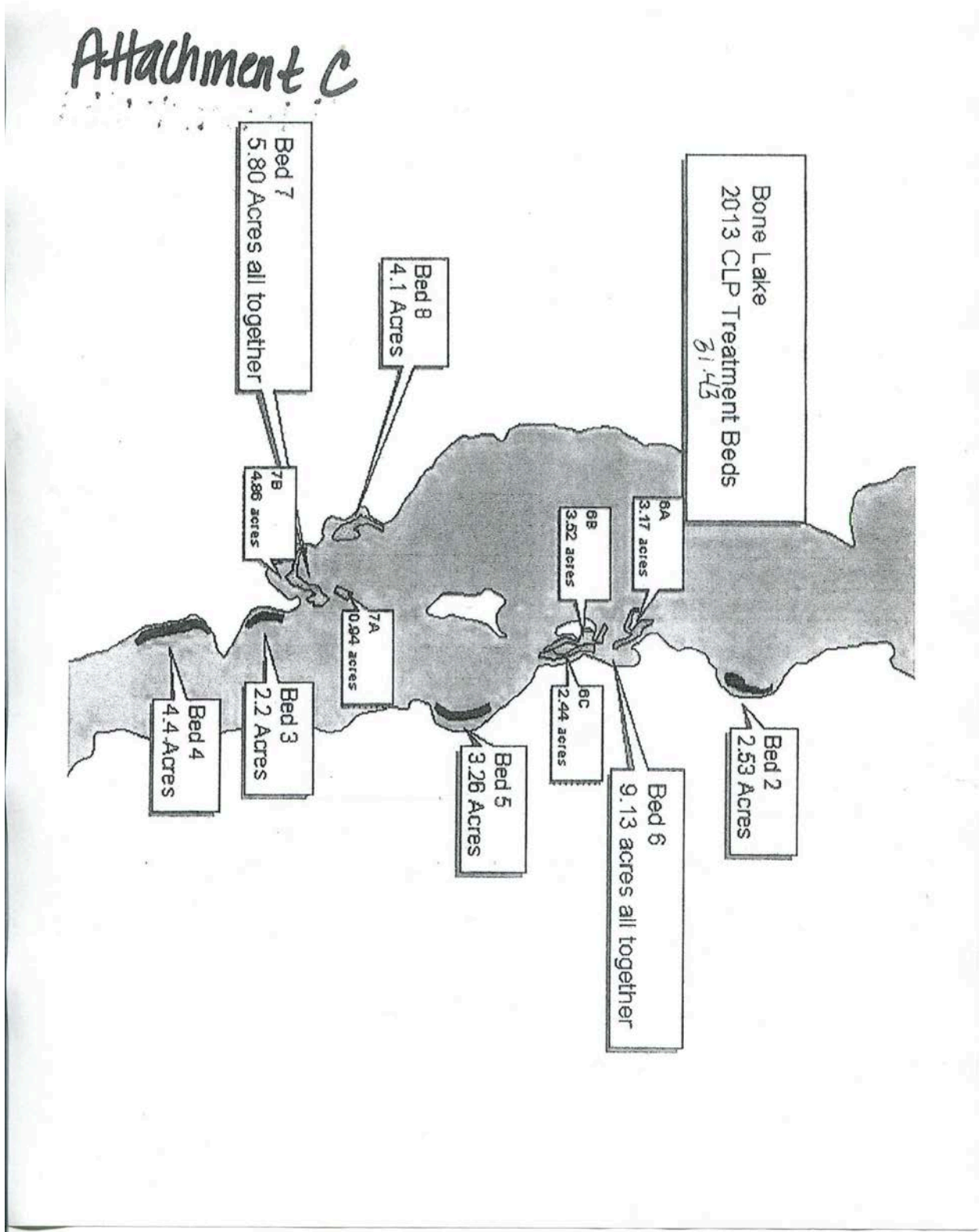
in water samples are reported as mg/L or ug/L acid equivalent (ae). An endothall concentration of 2.0 mg/L ai is equal to 1.42 mg/L ae or 1420 ug/L ae.

Peak endothall concentrations in samples collected from sample sites B5, B6 A and B6 B ranged from 100 to 670 ug/L ae at 1 HAT compared to the target concentration of 1420 ug/L ae (Figure 3). The endothall concentration at all sample sites declined to less than a 100 ug/L ae, baseline by 6 HAT.

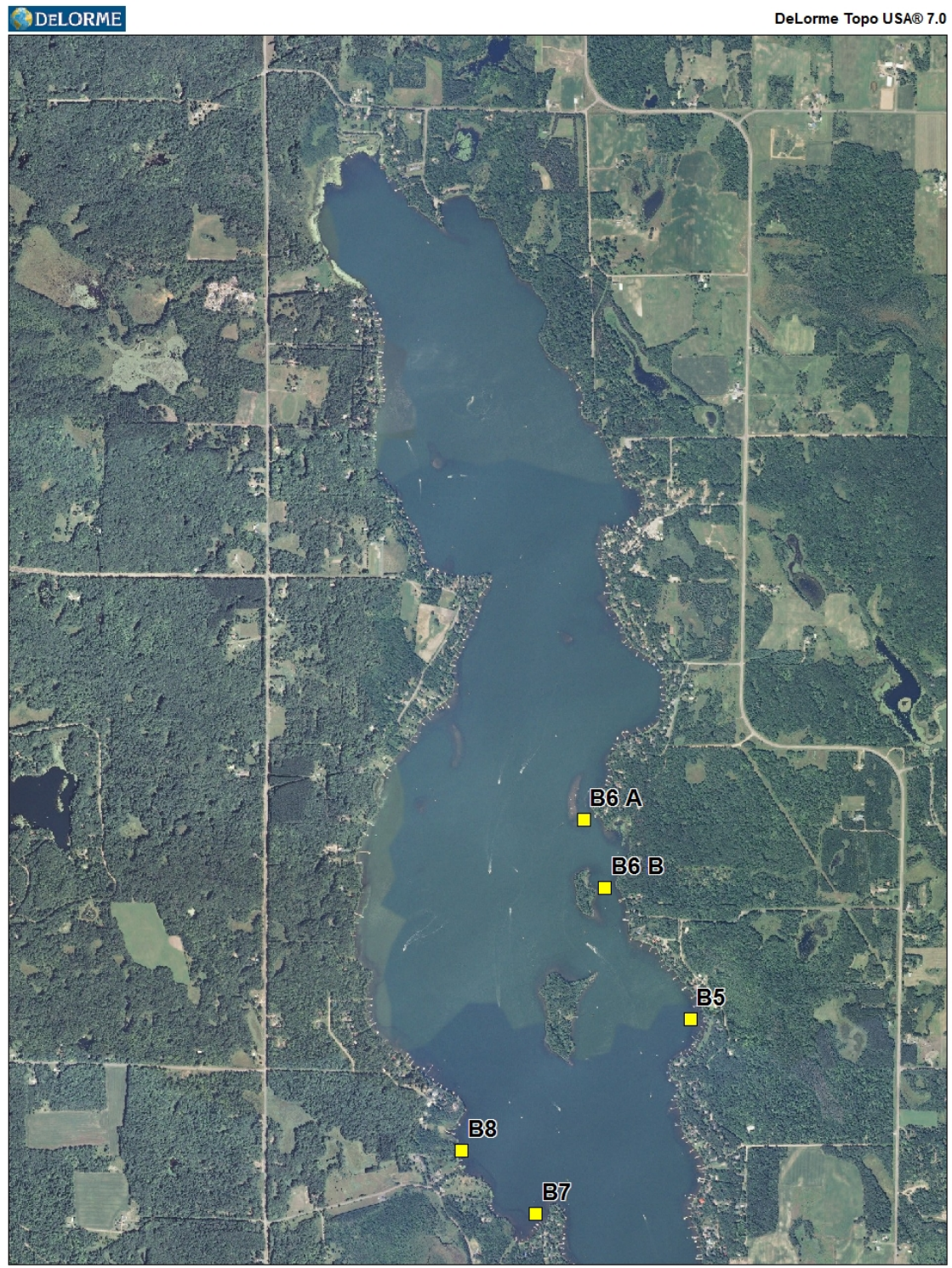
Peak endothall concentrations in samples collected from sample sites B7, and ranged from 300 and 530 ug/L ae at 1 to 3 HAT compared to the target concentration of 1420 ug/L ae (Figure 4). The endothall concentration at all sample sites declined to less than a 100 ug/L ae, baseline by 6 HAT.

Based on endothall concentration data, dissipation from herbicide target areas was rapid, and by 1 HAT 53 to 93% of the herbicide had moved off target. Endothall from treatment areas B5, B6 A, B6 B, and B6 likely merged into a larger treatment area within 3 HAT and maintained concentrations greater than the detection limit for at least 24 HAT. Endothall from treatment areas B7 A, B7 B, and B8 also likely merged into a larger treatment area within 3 HAT and maintained concentrations greater than the detection limit for at least 24 HAT.

Figure 1. Bone Lake 2014 Endothall Treatment Locations



### Figure 2. Bone Lake 2014 Endothall Sample Locations



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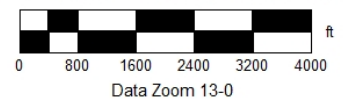
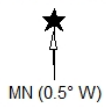


Figure 3

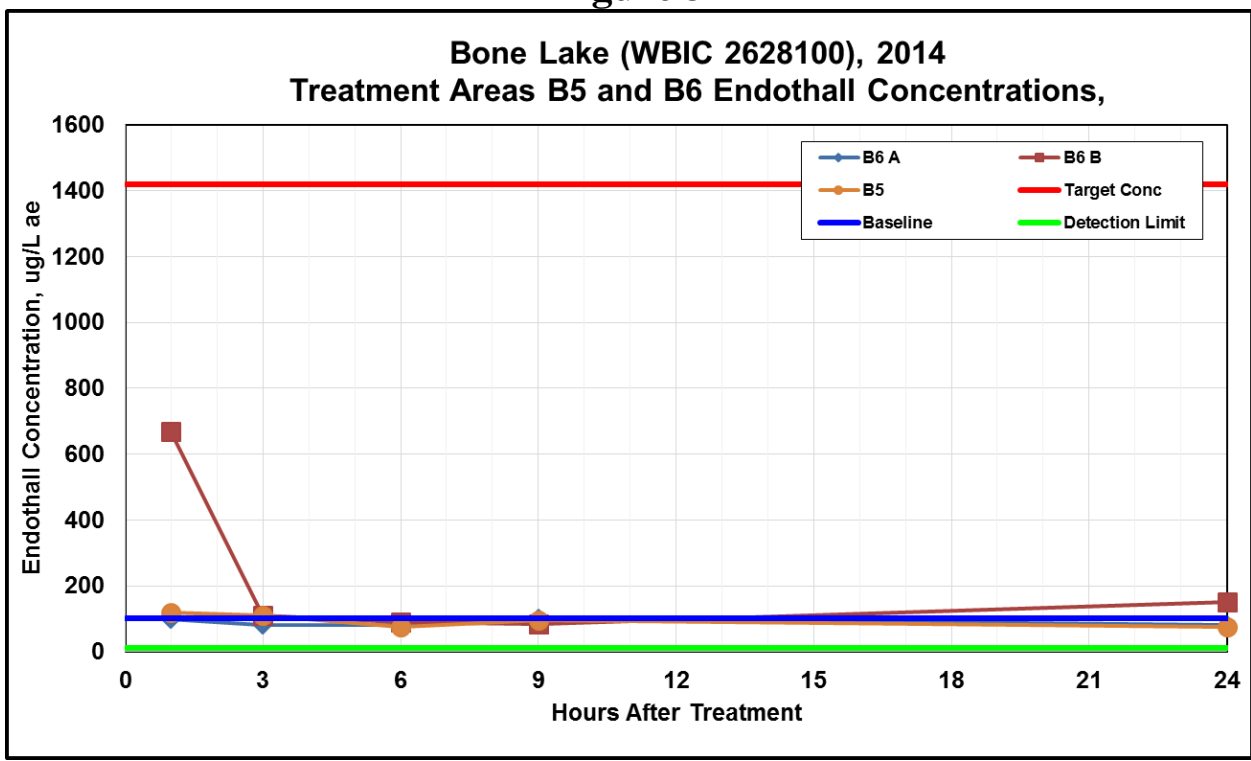
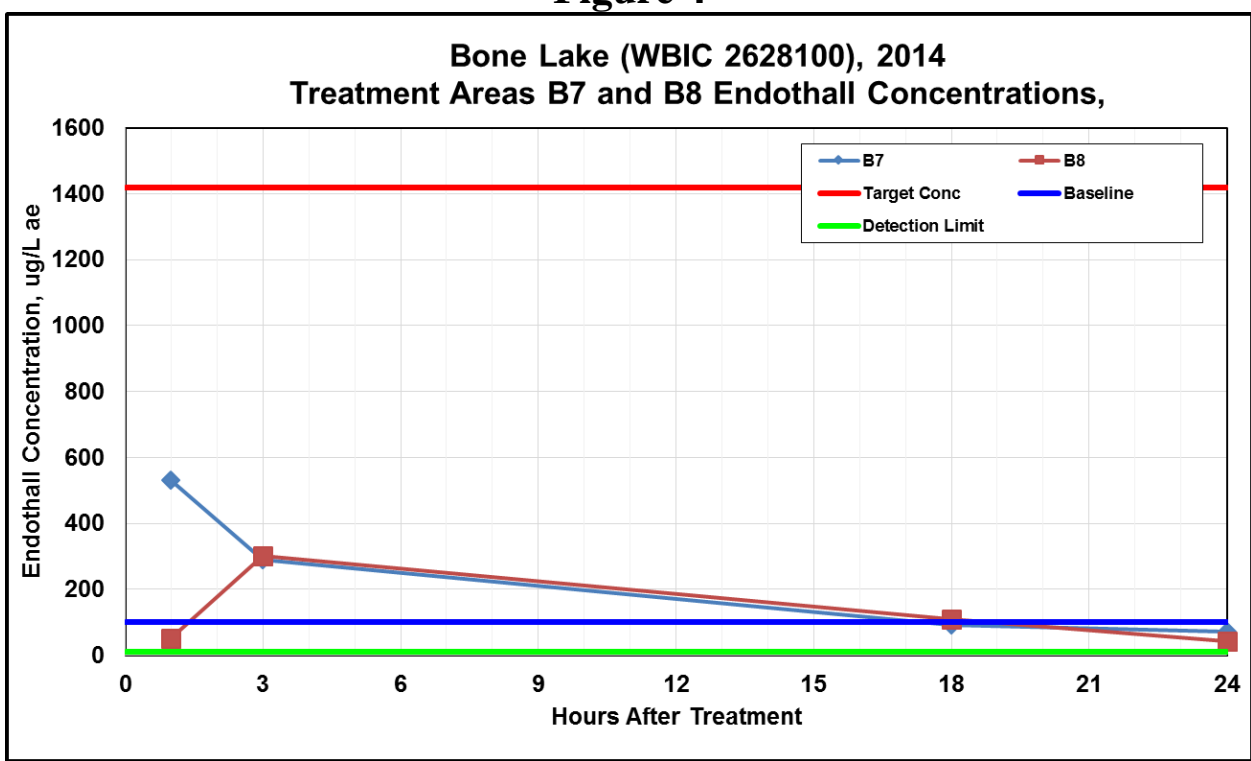
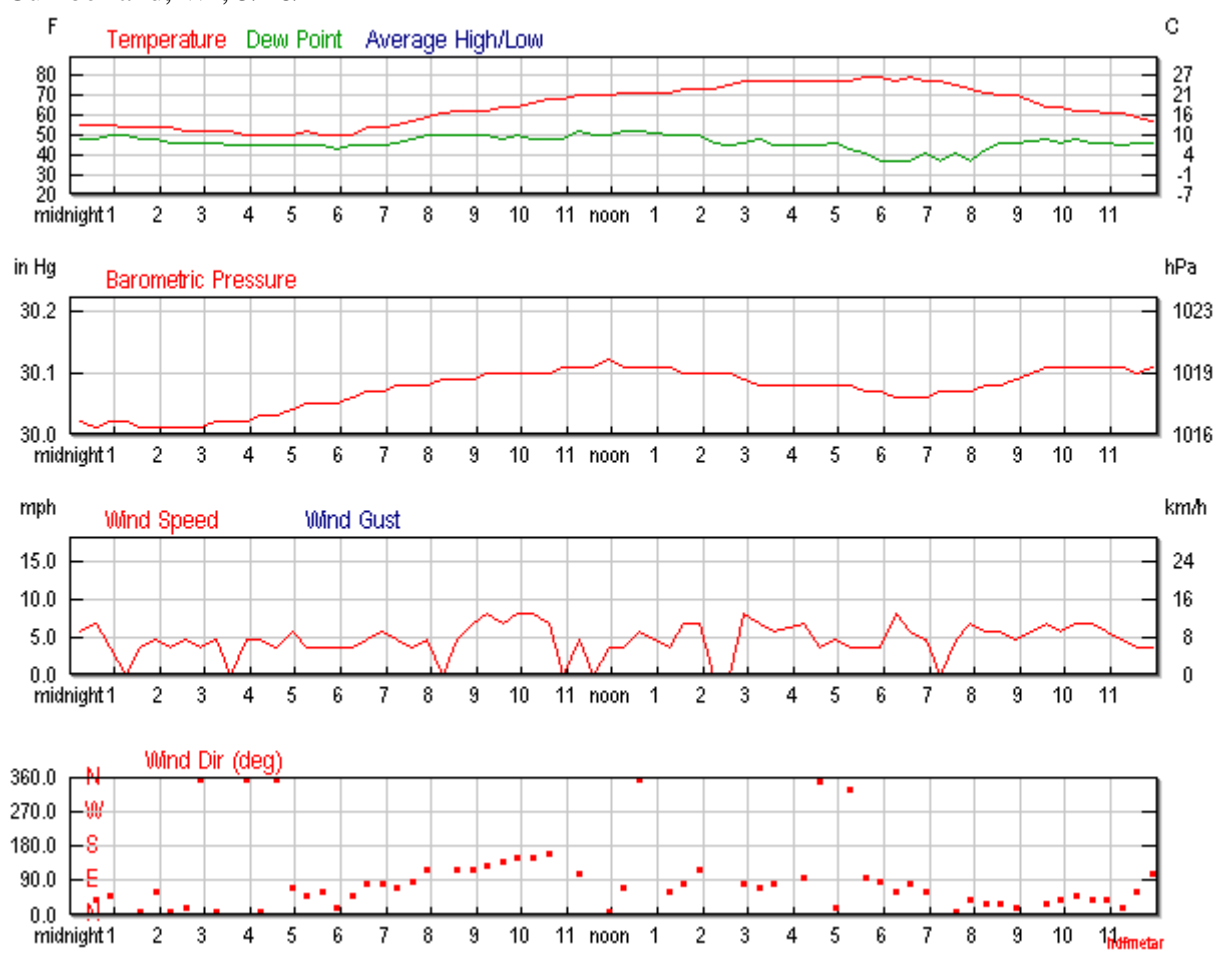


Figure 4

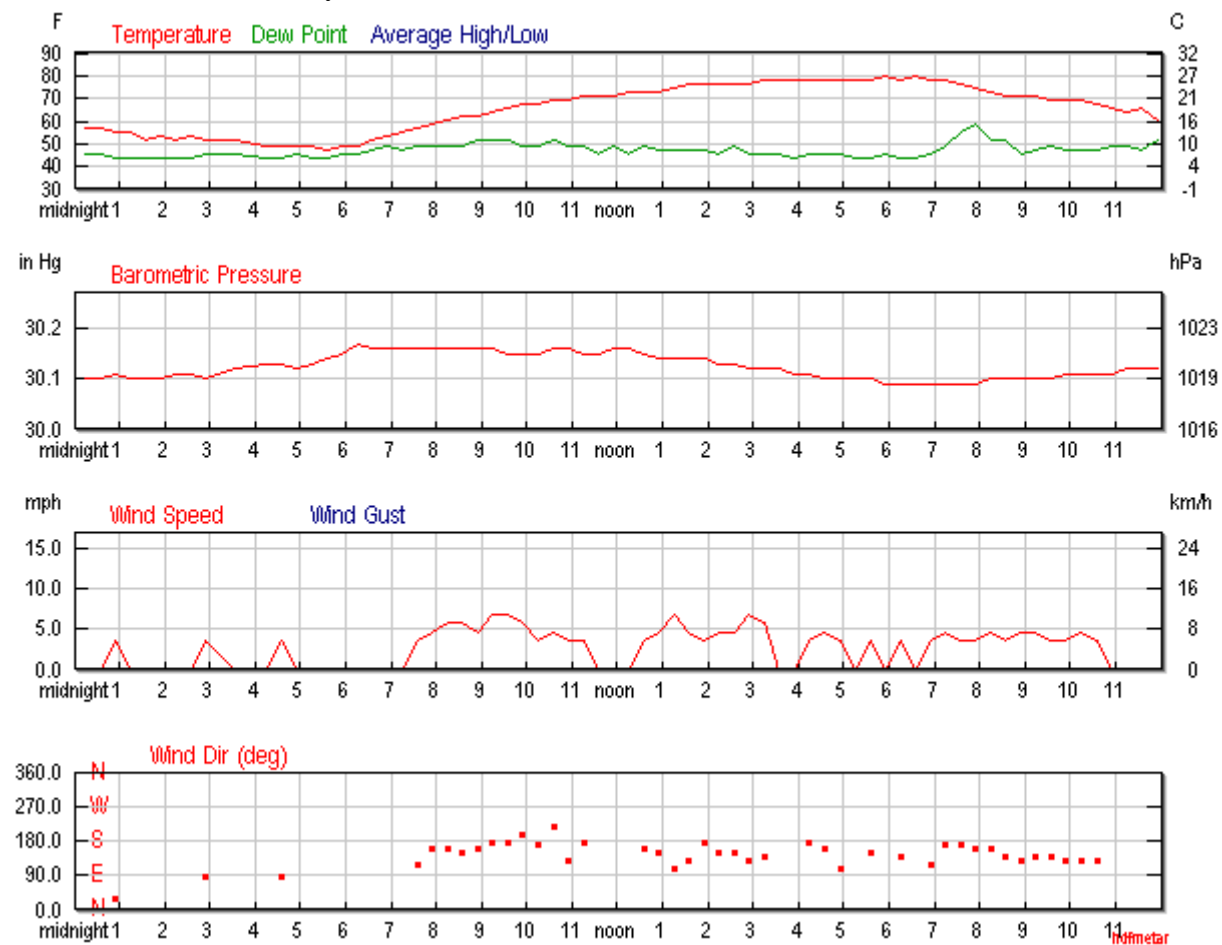


# Appendix

Cumberland, WI, 5/28/14



### Cumberland, WI, 29 May 14



### Cumberland, WI, 30 May 14

