

2nd Quarter Wind Resource Interim Report Arkansas Anemometer Loan Program

Site: Booneville, AR
Period: 03.31.2010-
06.28.2010

Details

Site	Booneville, AR
Participant	Terry Dunham
Project no.	002
Latitude	N 35° 7' 35.76"
Longitude	W 93° 59' 18.23"
Elevation	209 m
Soil Type	Mixed Rocky soil and superficial Bedrock (Rock and screw-in anchors installed)
Mast height	34 m
Report Quarter	2nd quarter data (03.31.2010-06.28.2010)

Basic Data Information

Frequency of data checks	Daily/weekly
Data Acquisition	Per day
Start date	03/31/2010 00:00
End date	06/28/2010 00:00
Duration	89 days
Length of time step	10 minutes
Total Number of Data	12,816

Monthly Wind Velocity Averages at 34 m

Year	Month	Possible Records	Recovery Rate (%)	Mean (m/s)	Min (m/s)	Max (m/s)	Std. Dev. (m/s)	Weibull k	Weibull c (m/s)
2010	Mar	144	100	5.94	2.2	10.5	2.05	3.22	6.65
2010	Apr	4320	100	4.32	0.4	13.2	2.43	1.8	4.84
2010	May	4464	100	3.61	0.4	13.7	1.99	1.86	4.05
2010	June	3888	100	3.23	.04	11.2	1.77	1.87	3.63
All data		12,816	100	3.76	0.4	13.7	2.15	1.78	4.22
Mean of monthly means				3.76					

1. Status of Relevant Sensors

The state of all relevant sensors is periodically checked by visual inspection of data. Additionally, all signals are regularly checked by automatic failure detection to provide a general overview on the course of the operated measurement campaign. No correction of mast has been applied either.

Status of Relevant Sensors

Remark: The automatic failure detection algorithm is based on predefined measures of failure or plausibility. The table above lists the results as percentage of the total available data. "Availability" gives the portion of remainders after removing faulty values. The following columns represent the portion of faulty values according to each failure definition. Four kinds of failure were checked: plausible "range¹", "icing²" (only anemometers and wind vanes), "constant value³", "related⁴" (mutual consistence test if reference sensor available) and "vMax"⁵.

Sensor/Signal	Availability	Failure Checks				
		Range	Icing	Constant Value	Related	VMax
V34 Due West	97.8%	0%	0%	0%	0%	2.2%
V34 Due East	97.6%	0%	0%	0%	0%	2.40%
V20 Due West	96.44%	0%	0%	0%	0%	3.56%
WVane 33	100%	0%	0%	0%	0%	0%
Temp	100%	0%	0%	0%	0%	0%

¹ Wind speed: 0 – 25 m/s, temperature: -20 – +50 °C

² Consecutive constant values during combined conditions of temperature (<2°C)

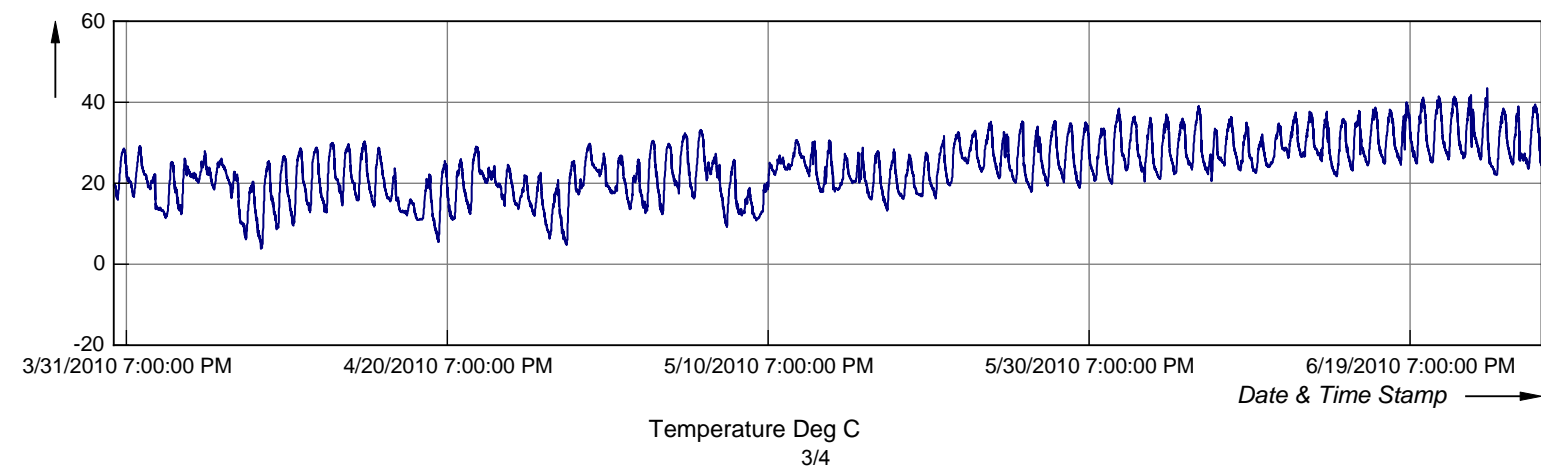
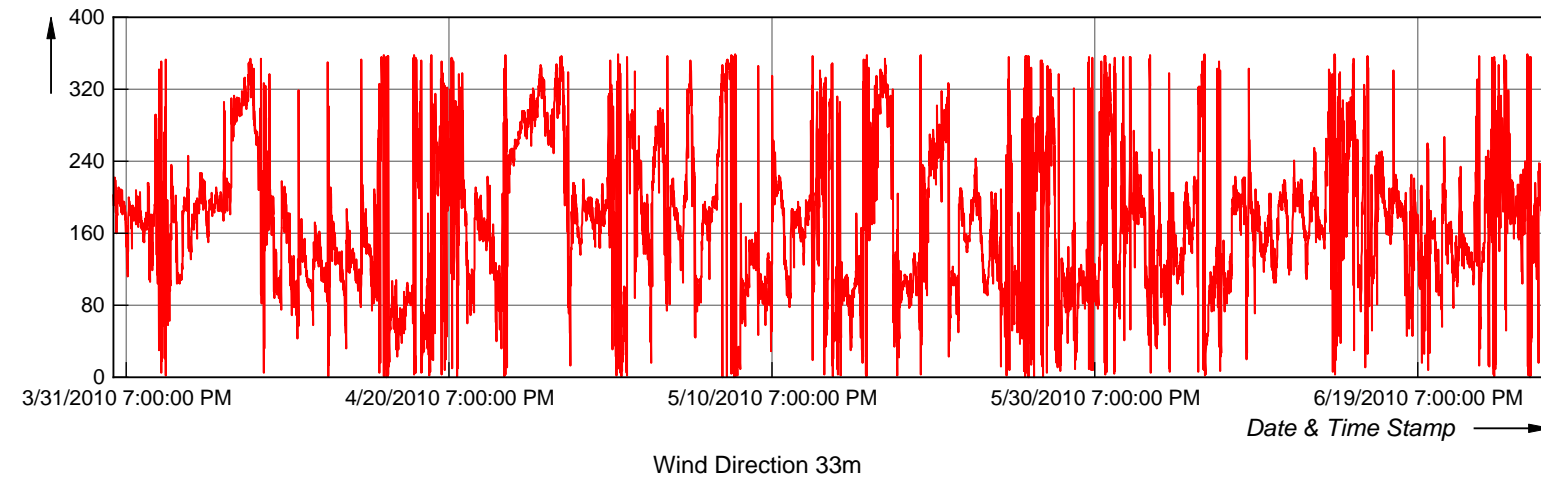
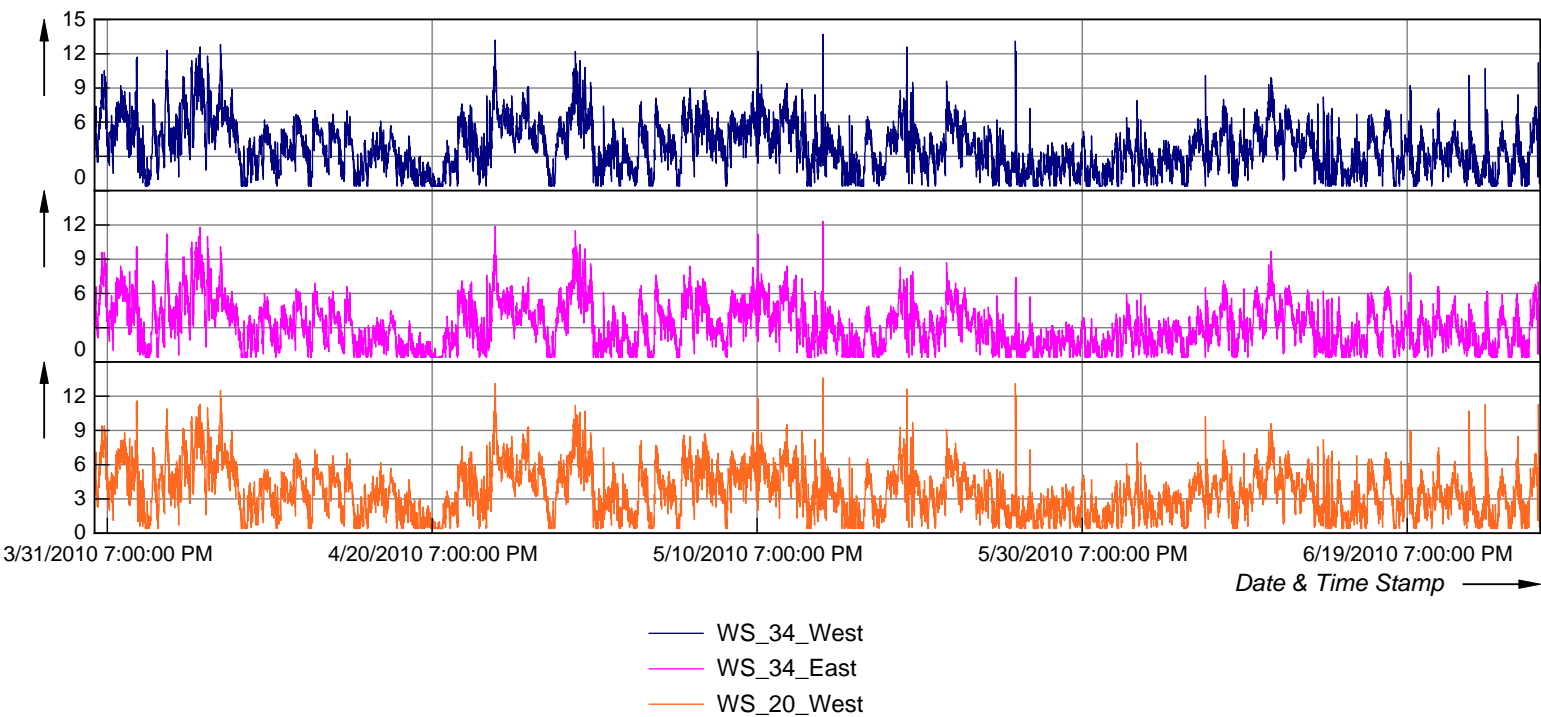
³ Constant values for minimum 3 consecutive 10-min intervals (only average)

⁴ Ratio of tested signal and reference signal: 1/3 – 3 [dimensionless]

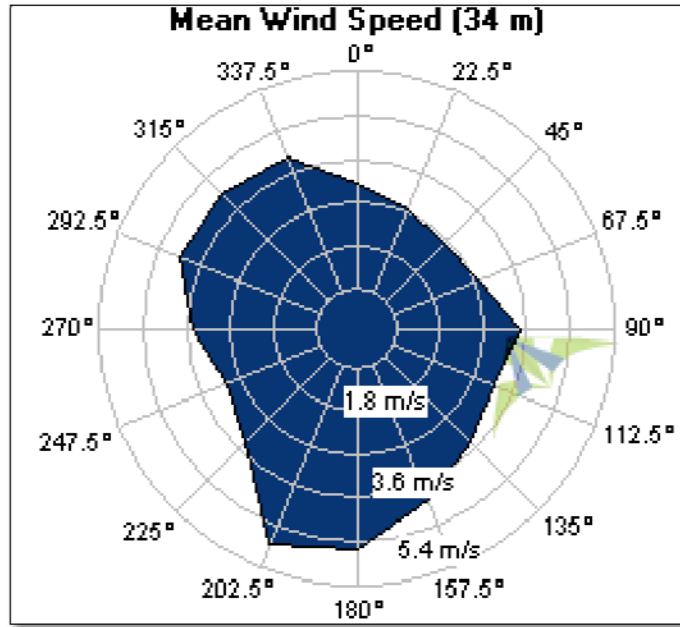
⁵ $v_{max} > 2.5 * v_{avg}$ (10-min-interval)

2 Booneville/Logan Site Intermediate Evaluation

2.1 Average Timeseries Plots, all relevant sensors



2.2. Wind Rose: Graphical Presentation of joined wind speed and direction (Top Anemometer 34W) (North = 0 Deg ; South = 180 Deg ; West = 270 Deg ; East = 90 Deg)



2.3 Graphical Presentation of wind speed distribution (Top Anemometer _34 W)

