

Contrasting Round Robin to NA experience



Results from 16 sites with RS

Site	z	α	z	α	z	α	z	α
A	39-59	0.19	59-80	0.21	80-100	0.22	100-140	0.21
B	40-60	0.19	60-80	0.19	80-100	0.19	100-120	0.19
C	40-60	0.16	60-80	0.15	80-100	0.16	100-120	0.15
D	40-55	0.18	55-85	0.18	85-100	0.20	100-120	0.21
E	40-60	0.19	60-80	0.18	80-100	0.17	100-120	0.16
F	44-59	0.27	59-79	0.27	79-109	0.27	109-119	0.27
G	40-60	0.33	60-80	0.28	80-100	0.26	100-120	0.26
H	40-60	0.19	60-80	0.22	80-100	0.24	100-120	0.25
I	40-60	0.27	60-80	0.29	80-100	0.31	100-120	0.34
J	40-60	0.27	60-80	0.28	80-100	0.29	100-120	0.31
K	40-60	0.23	60-80	0.25	80-100	0.25	100-120	0.25
L	40-60	0.22	60-80	0.22	80-100	0.21	100-120	0.19
M	40-80	0.30	80-121	0.29	121-136	0.23	136-141	0.19

Note: α = Shear Exponent, z = Height [m]

Methods

- The relationship between the MEqWS and measured 80 m wind speeds (WS80), was expressed as MEqWS bias, where

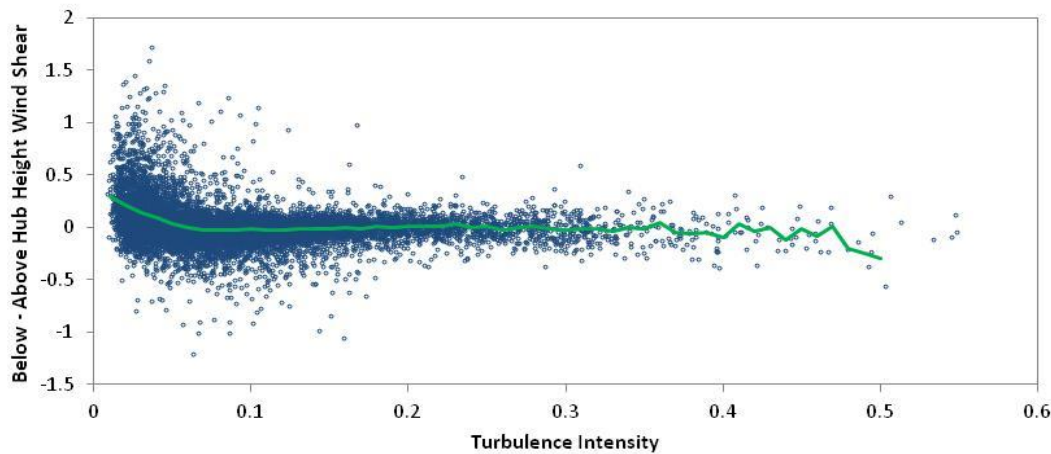
$$MEqWS \text{ Bias} = \left(\frac{MEqWS}{WS80} \right) - 1$$

- Where the hub height is assumed to be 80 m

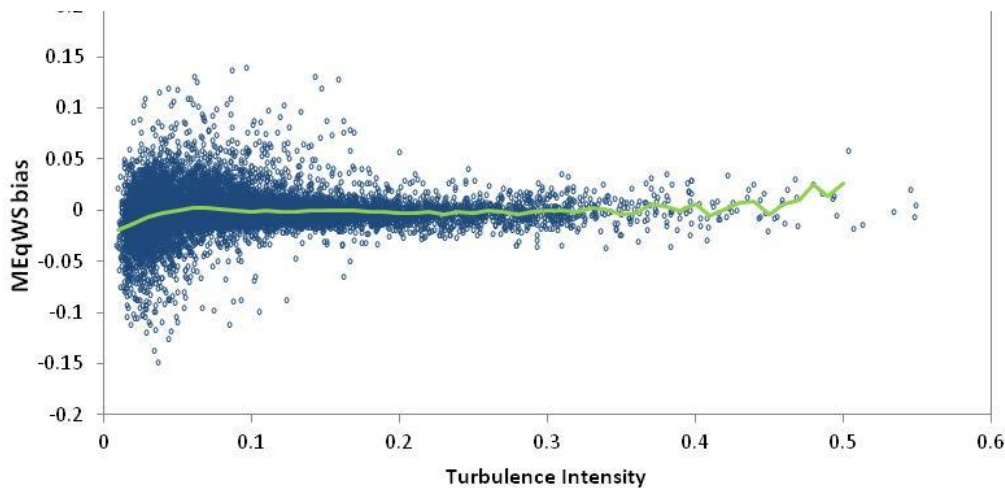
Results

Site	Wind Speed [m/s]		MEqWS Bias
	Measured at 80 m	MEqWS	
A	8.67	8.67	1.000
B	8.09	8.08	0.999
C	5.49	5.50	1.000
D	8.31	8.31	1.001
E	8.00	7.98	0.997
F	7.29	7.29	1.000
G	5.77	5.84	1.013
H	8.09	8.14	1.006
I	8.60	8.66	1.008
J	9.46	9.51	1.005
K	9.05	9.06	1.002
L	8.57	8.54	0.996
M	7.06	7.04	0.997

Results



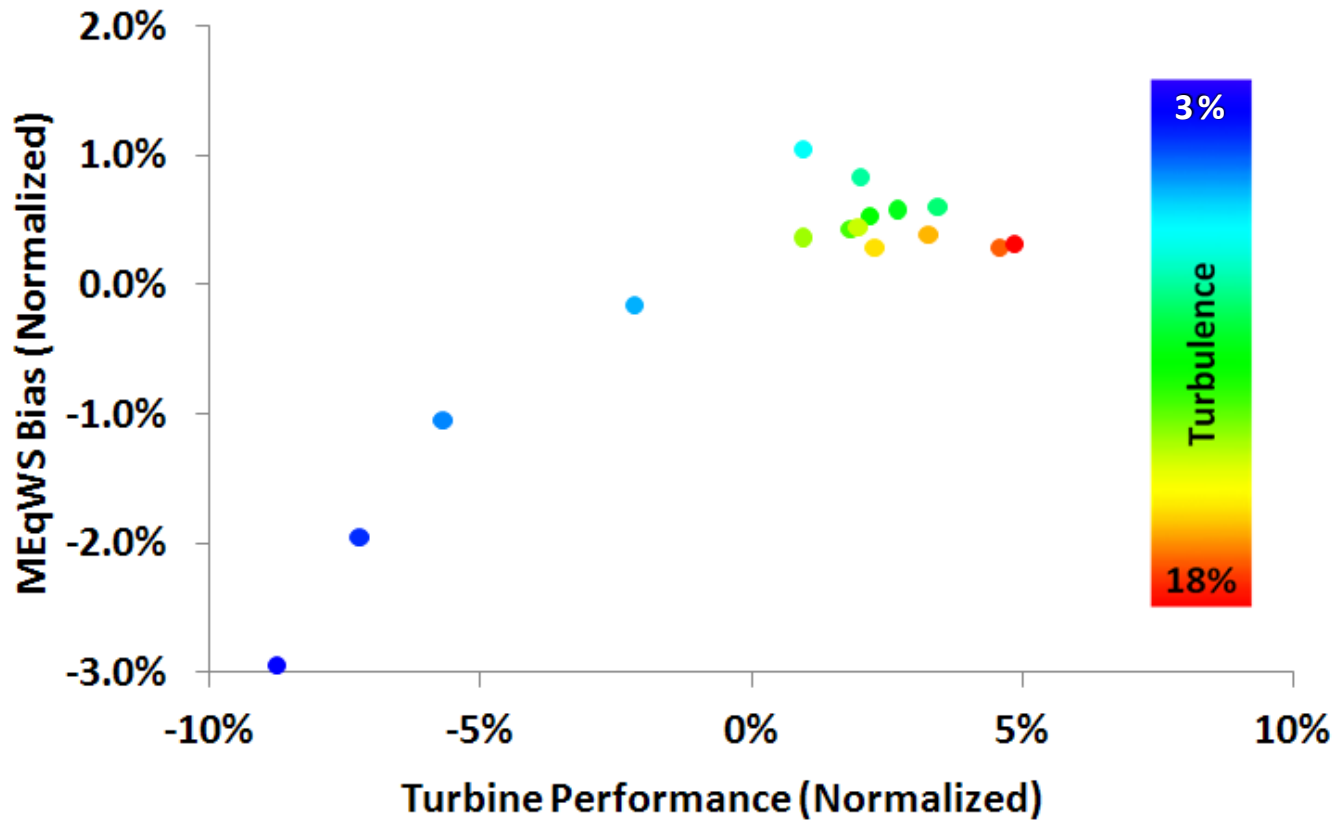
○ $\Delta\alpha$ — $\overline{\Delta\alpha}$



○ MEqWS bias — mean MEqWS bias

- Shear and MEqWS are both influenced by atmospheric stability
- During low Turbulence Intensity the difference in shear above and below hub height is greater. Naturally reflected in MEqWS bias.

Results



Normalized MEqWS Bias and Turbine Performance at Site J