

# Data Summary Report

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QC - Yamaska 2-100m (0092)

**Installation date:** 2014/12/13

**Period of record:** 2014/12/17 - 2016/01/01

**Selected period:** 2015/01/01 - 2016/01/01

**Municipality:** Yamaska

**Province / State:** Quebec

**Country / Region:** Canada

**Time Zone:** Eastern

**Longitude:** -72.92028°

**Latitude:** 45.98873°

**Elevation:** 19m

windserver

## Messages and Alerts

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

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### ERRORS

- None

### WARNINGS

- None

### INFORMATION

- INFO RangeCheckLimits: Calculated Bp for elevation of 18.50m is 101.10 kPa.
- INFO RangeCheckLimits: Calculated Bp for elevation of 18.50m is 101.10 kPa.
- INFO Air Density at 80m: Calculating air density from local temperature and local pressure.
- INFO Air Density at 80m: Filling missing air density records with default value (1.2).
- INFO QcTraceSection: Data was resampled to 1440 minute intervals.
- INFO Air Density at 92m: Calculating air density from local temperature and local pressure.
- INFO Air Density at 92m: Filling missing air density records with default value (1.2).
- INFO TurbineModel: GE 1.5sle 77m: The standard air density power curves used to calculate yields were adjusted according to IEC 61400-12-1:2005 to reflect the air density for the site. (37808)
- INFO Air Density at 100m: Calculating air density from local temperature and local pressure.
- INFO Air Density at 100m: Filling missing air density records with default value (1.2).
- INFO TurbineModel: REpower MM92-hh100: The standard air density power curves used to calculate yields were adjusted according to IEC 61400-12-1:2005 to reflect the air density for the site. (51795)
- INFO TurbineModel: (PDS) Senvion MM92 -100 m HH: The standard air density power curves used to calculate yields were adjusted according to IEC 61400-12-1:2005 to reflect the air density for the site. (51795)

## Validity Summary

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

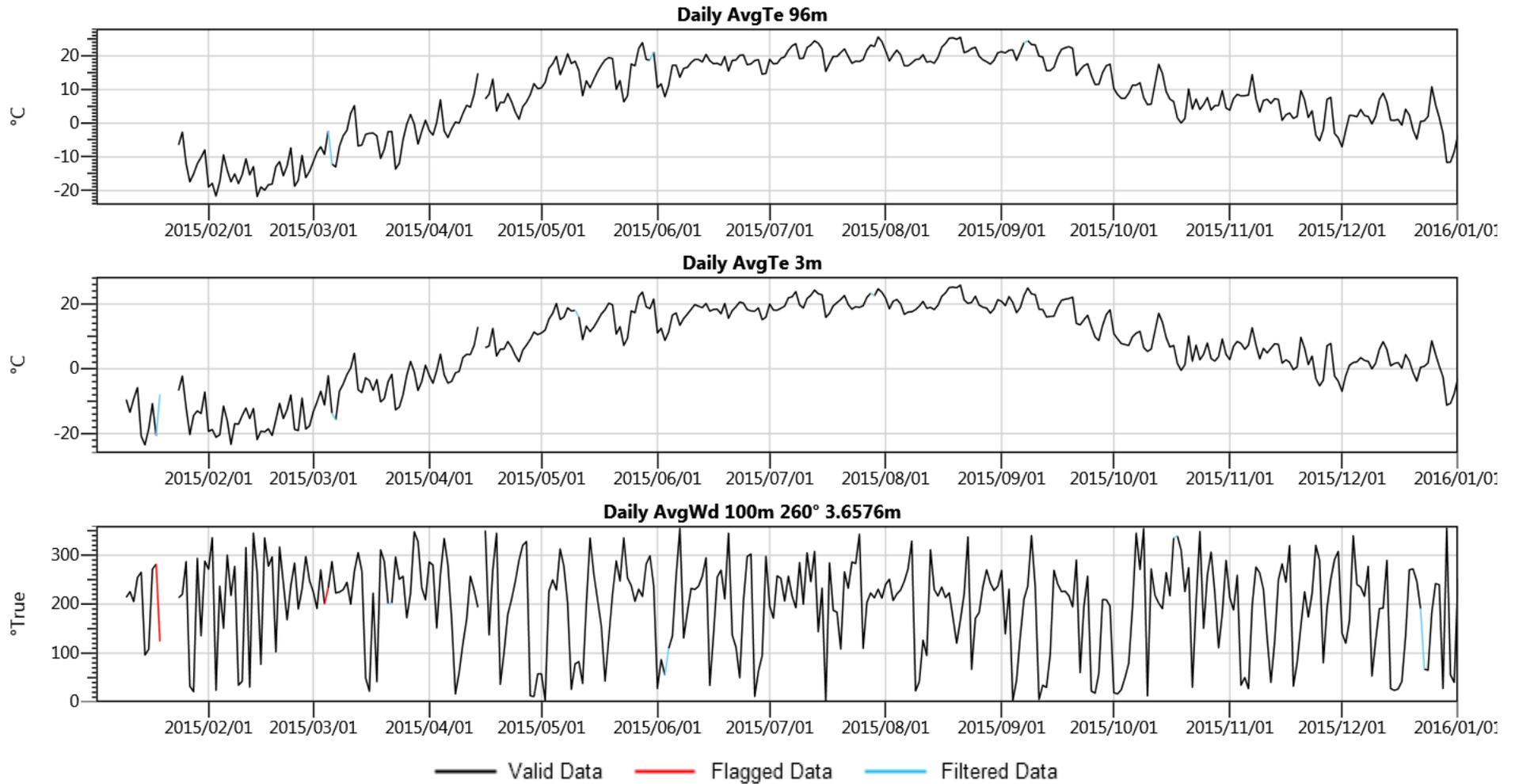
Wind Speed	Valid (%)	Icing (%)	Flagged (%)	Filtered (%)	Missing (%)	Mean (m/s)	Std Dev (m/s)	Max Value (m/s)	Max Gust (m/s)
Ws 100m 080° 3.6576m	91.80	5.08	1.54	0.00	1.58	6.59	2.95	22.95 (2015/04/13 22:40:00)	28.16 (2015/04/13 22:40:00)
Ws 100m 260° 3.6576m	98.17	0.07	0.18	0.00	1.58	6.33	3.03	22.72 (2015/04/13 22:40:00)	43.99 (2015/10/17 02:10:00)
Ws 98m 080° 3.6576m	92.75	3.42	2.25	0.00	1.58	6.72	3.09	23.21 (2015/04/13 22:40:00)	27.81 (2015/04/13 22:30:00)
Ws 98m 260° 3.6576m	92.18	5.08	1.16	0.00	1.58	6.51	2.92	22.72 (2015/04/13 22:40:00)	28.02 (2015/04/13 22:40:00)
Ws 79m 080° 3.6576m	92.75	3.42	2.25	0.00	1.58	6.36	2.90	21.86 (2015/04/13 22:40:00)	29.31 (2015/05/04 16:50:00)
Ws 79m 260° 3.6576m	93.10	5.08	0.11	0.13	1.58	6.16	2.76	21.51 (2015/04/13 22:40:00)	26.88 (2015/05/04 16:50:00)
Ws 59m 080° 3.6576m	92.75	3.42	2.25	0.00	1.58	5.87	2.69	20.55 (2015/04/13 22:40:00)	27.88 (2015/05/04 16:50:00)
Ws 59m 260° 3.6576m	93.17	5.08	0.15	0.02	1.58	5.61	2.62	20.65 (2015/04/13 22:40:00)	27.57 (2015/05/04 16:50:00)

Wind Direction	Valid (%)	Icing (%)	Flagged (%)	Filtered (%)	Missing (%)	Vector Average (°)	Average Standard Deviation (°)	Standard Deviation of Standard Deviation (°)
Wd 100m 260° 3.6576m	97.95	0.07	0.26	0.15	1.58	243.73	6.79	8.06
Wd 96m 320° 3.6576m	92.30	5.07	0.96	0.10	1.58	241.61	5.28	5.25
Wd 77m 320° 3.6576m	93.96	3.44	0.96	0.07	1.58	242.58	7.60	7.10
Wd 57m 320° 3.6576m	93.19	5.08	0.14	0.00	1.58	242.85	7.53	6.89

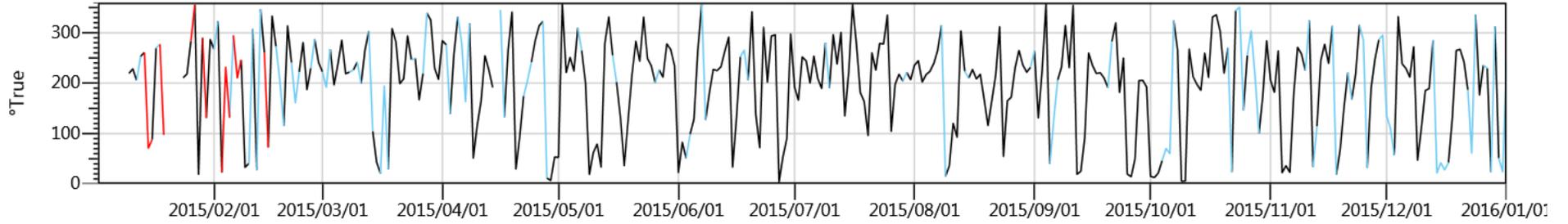
Other	Valid (%)	Flagged (%)	Filtered (%)	Missing (%)	Mean	Std Dev	Max	Min	Units
Temperature 96m	95.38	0.00	0.38	4.24	7.56	12.46	30.83	-24.61	°C
Barometric Pressure 3m	97.54	0.00	0.88	1.58	100.97	0.80	103.30	98.20	kPa
Battery Voltage 3m	98.42	0.00	0.00	1.58	17.43	11.59	26.52	-3.81	V
Relative Humidity 3m	98.42	0.00	0.00	1.58	74.99	17.26	98.40	19.93	%
Temperature 3m	98.41	0.00	0.01	1.58	6.58	13.30	32.11	-34.39	°C
Air Density 80m	-	-	-	-	1.25	0.06	1.42	1.15	kg/m³

## Quality Control Traces

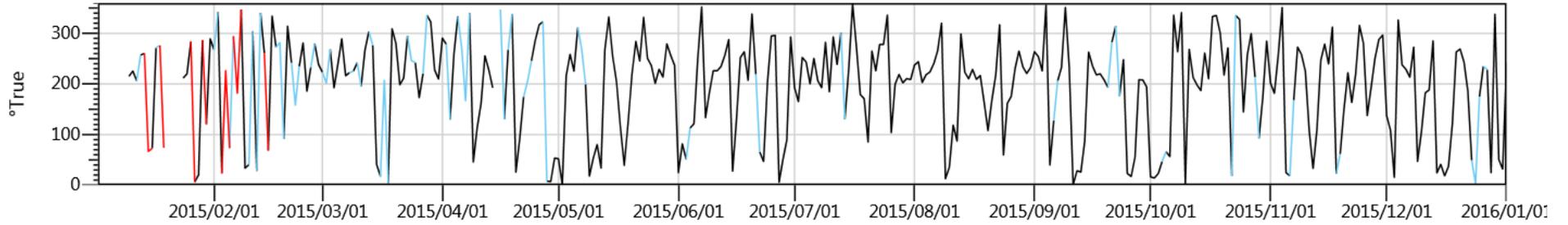
QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



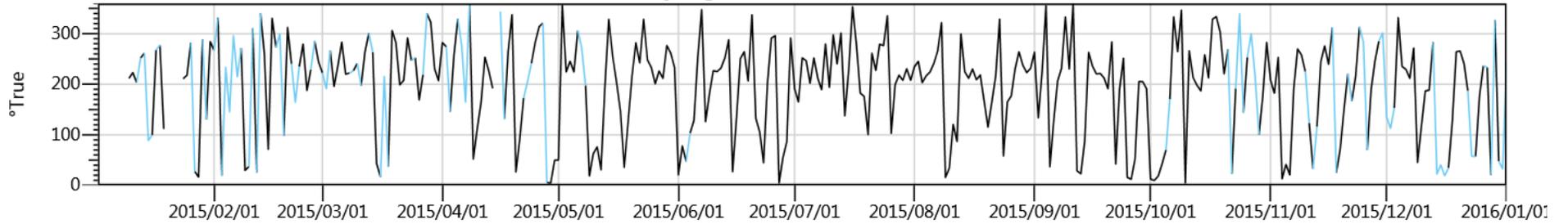
Daily AvgWd 96m 320° 3.6576m



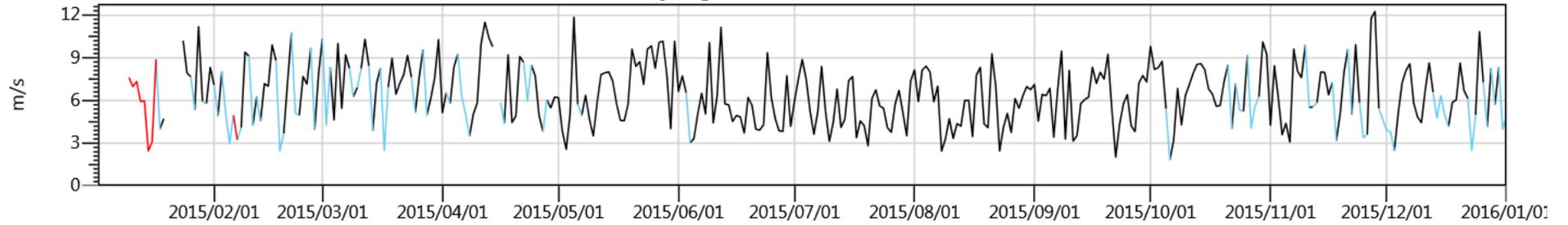
Daily AvgWd 77m 320° 3.6576m



Daily AvgWd 57m 320° 3.6576m

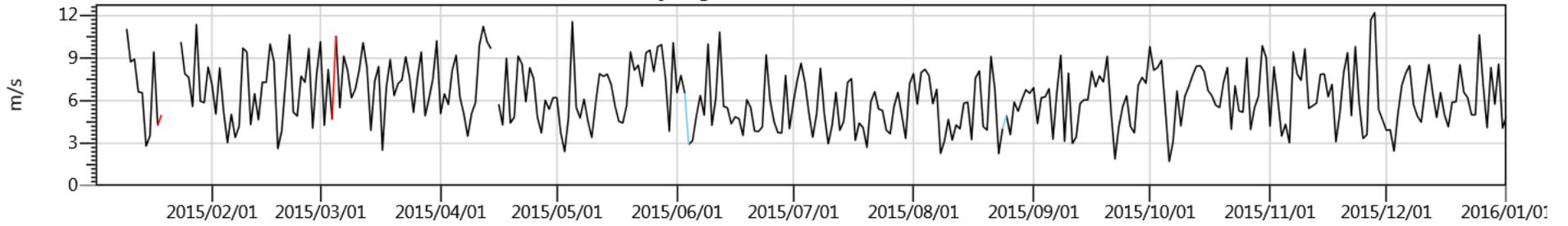


Daily AvgWs 100m 080° 3.6576m

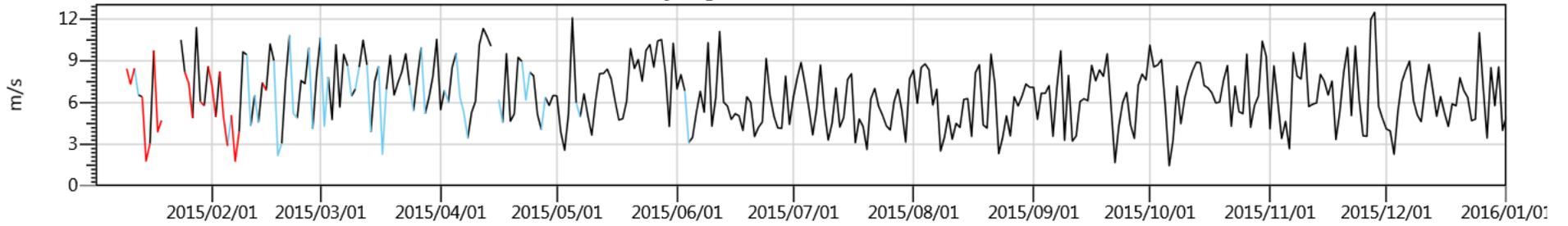


— Valid Data    — Flagged Data    — Filtered Data

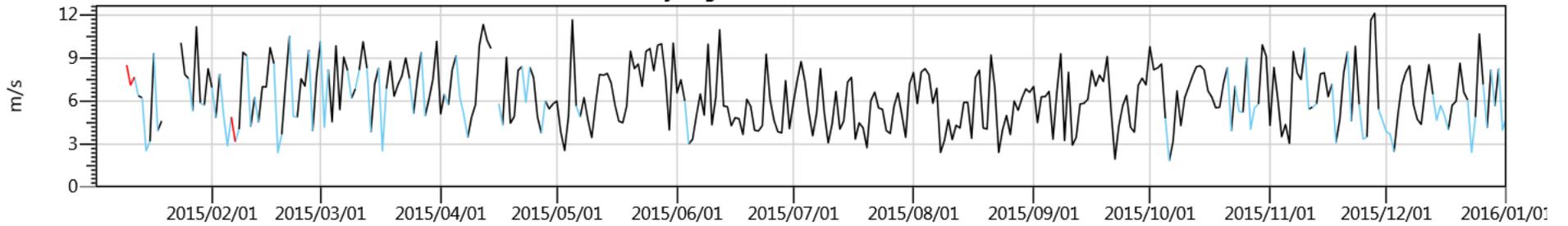
Daily AvgWs 100m 260° 3.6576m



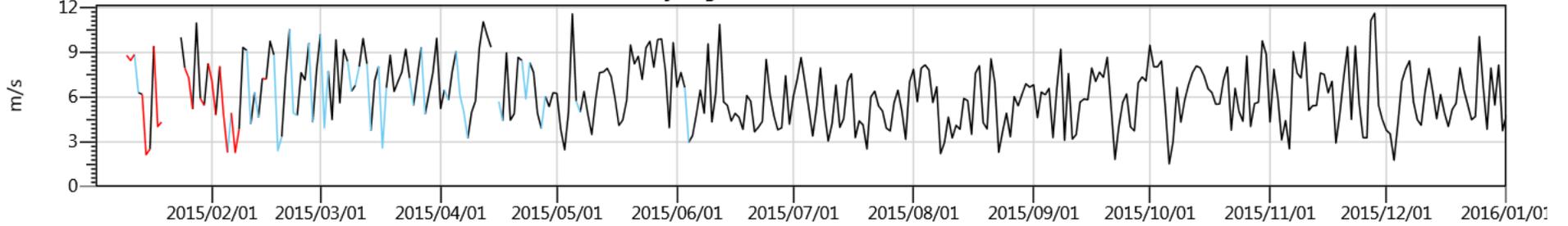
Daily AvgWs 98m 080° 3.6576m



Daily AvgWs 98m 260° 3.6576m

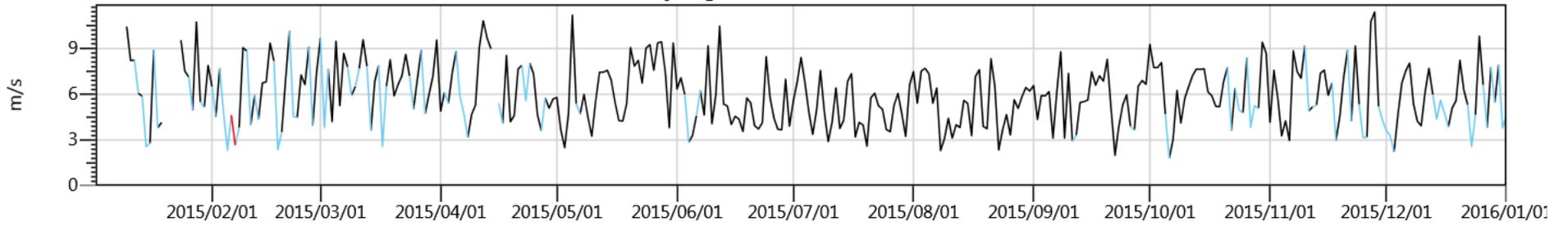


Daily AvgWs 79m 080° 3.6576m

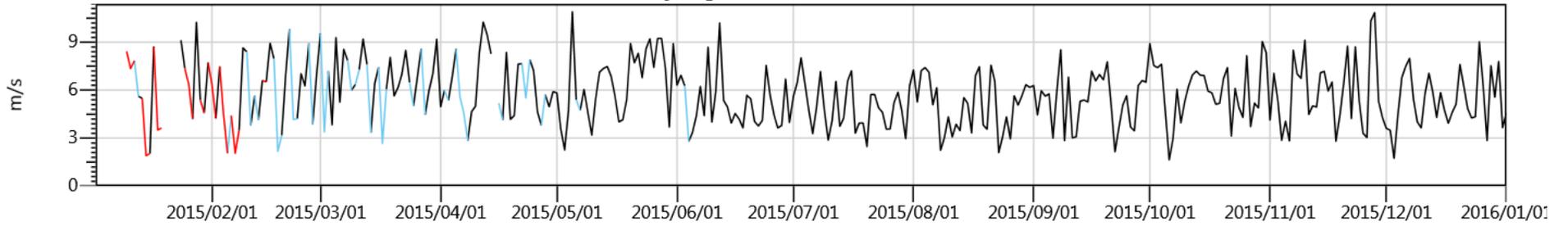


— Valid Data    — Flagged Data    — Filtered Data

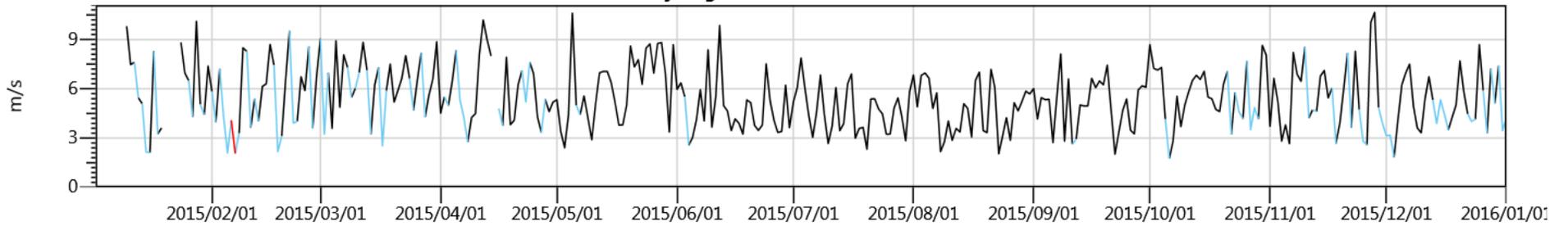
Daily AvgWs 79m 260° 3.6576m



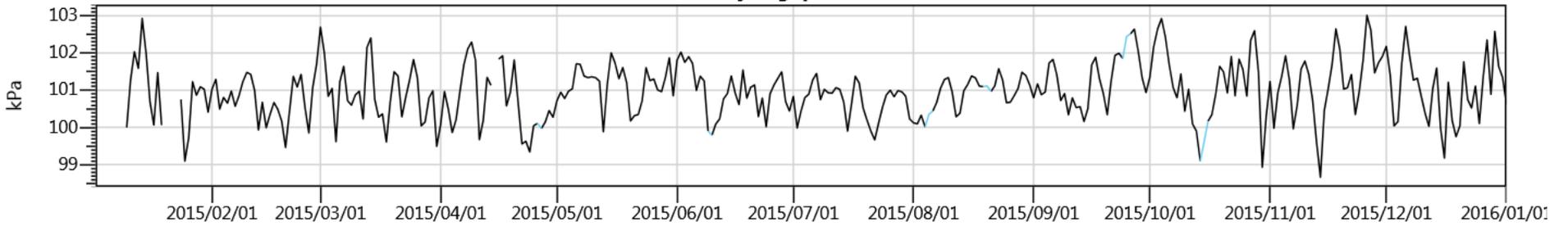
Daily AvgWs 59m 080° 3.6576m



Daily AvgWs 59m 260° 3.6576m

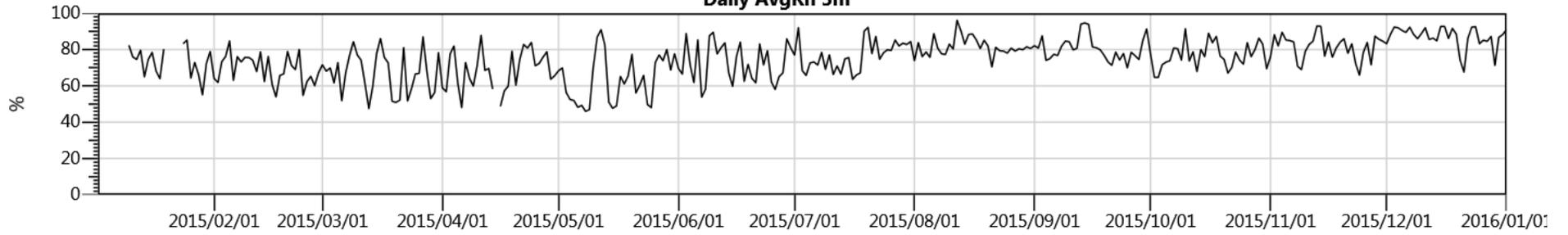


Daily AvgBp 3m

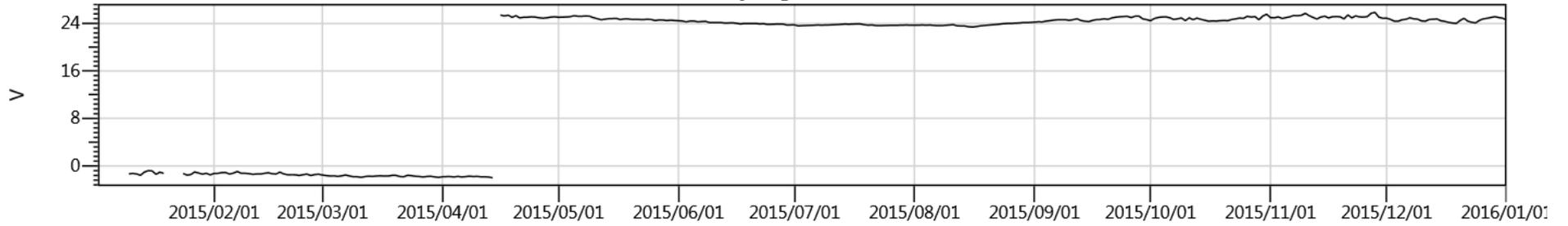


— Valid Data    — Flagged Data    — Filtered Data

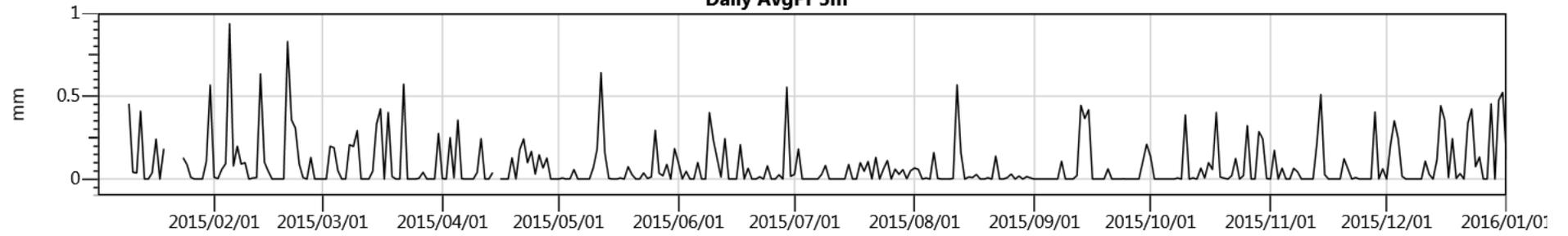
Daily AvgRh 3m



Daily AvgBv 3m



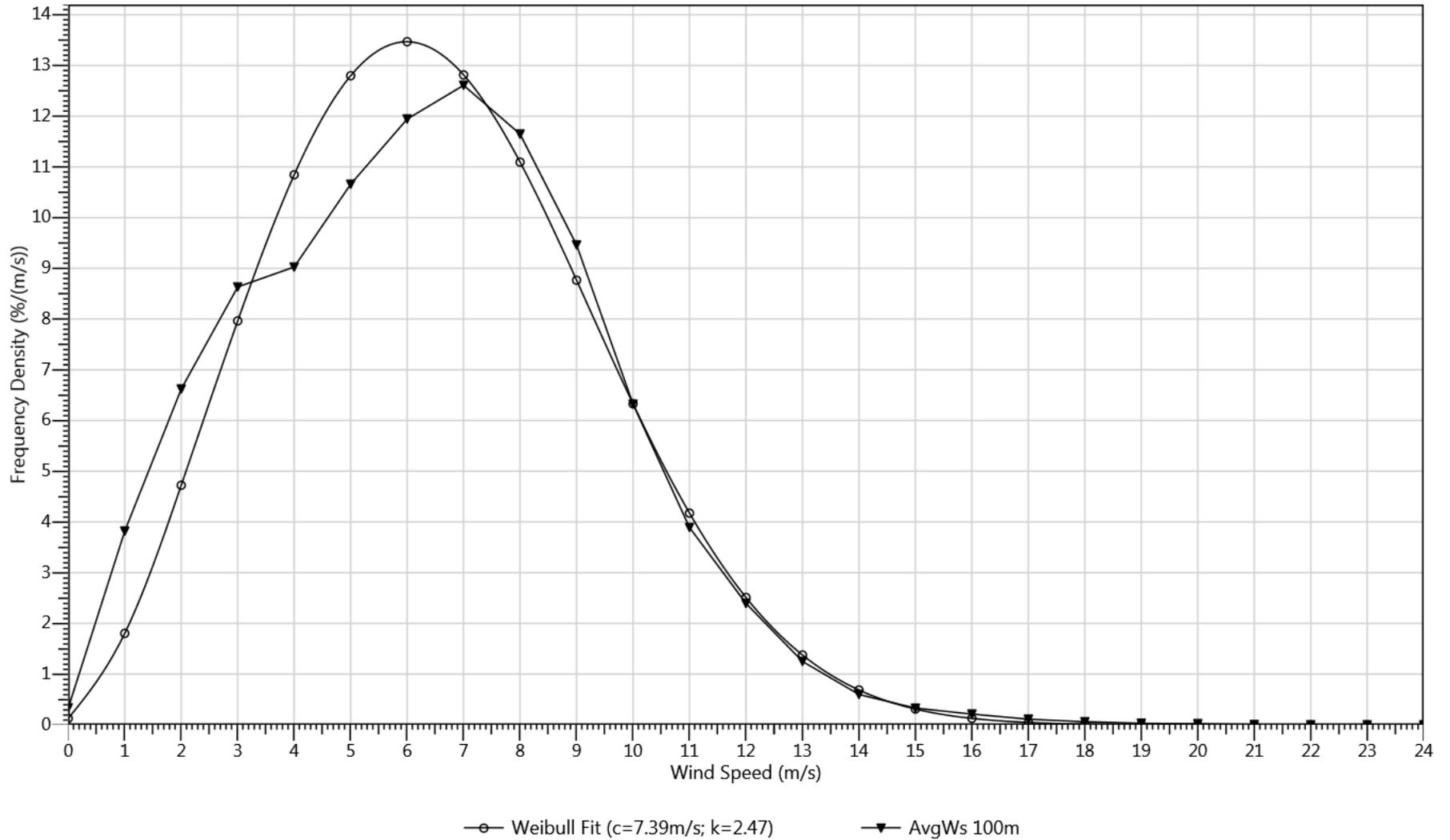
Daily AvgPr 3m



— Valid Data    — Flagged Data    — Filtered Data

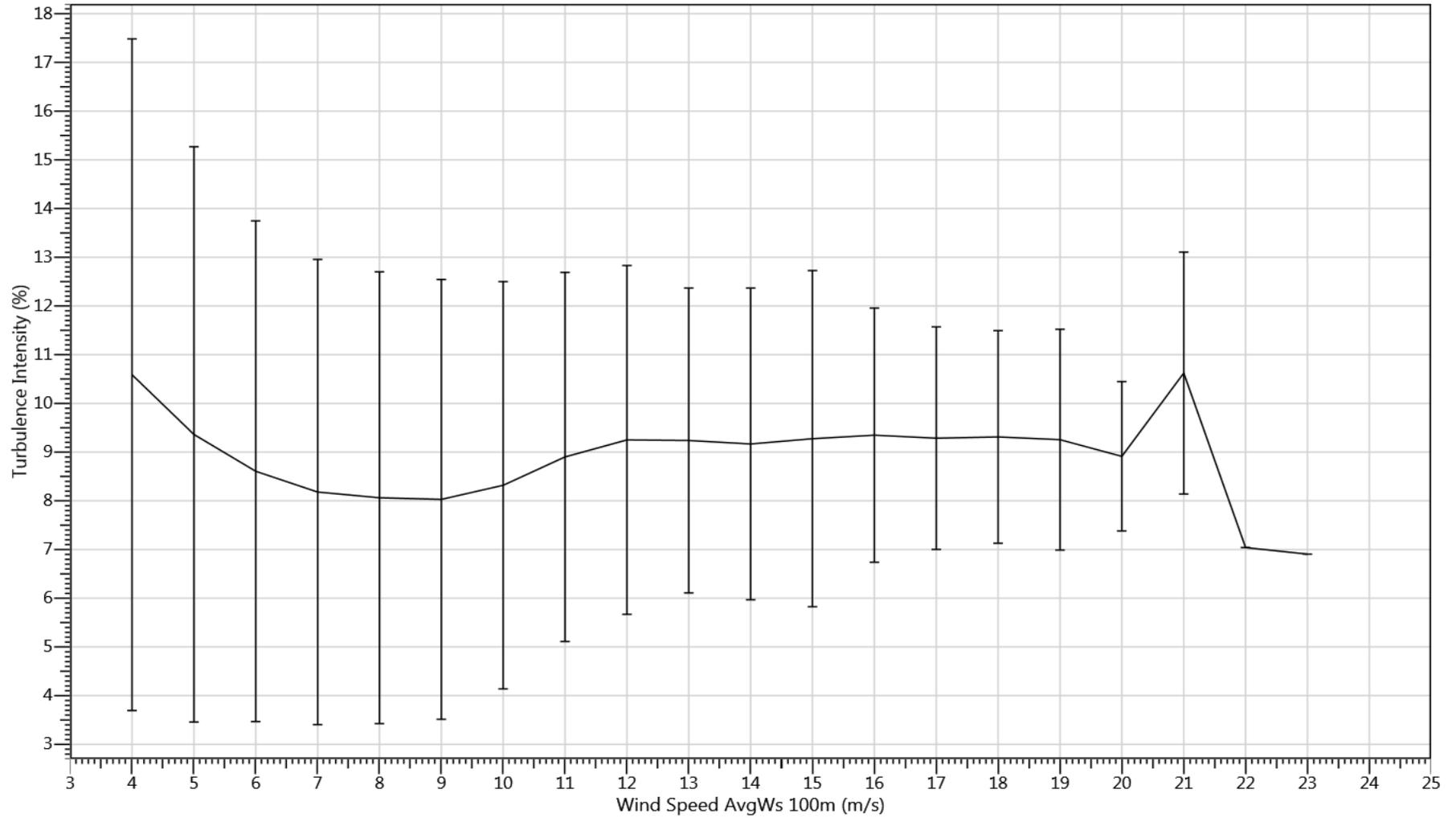
# Wind Speed Distribution

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



## Turbulence Intensity at 100m

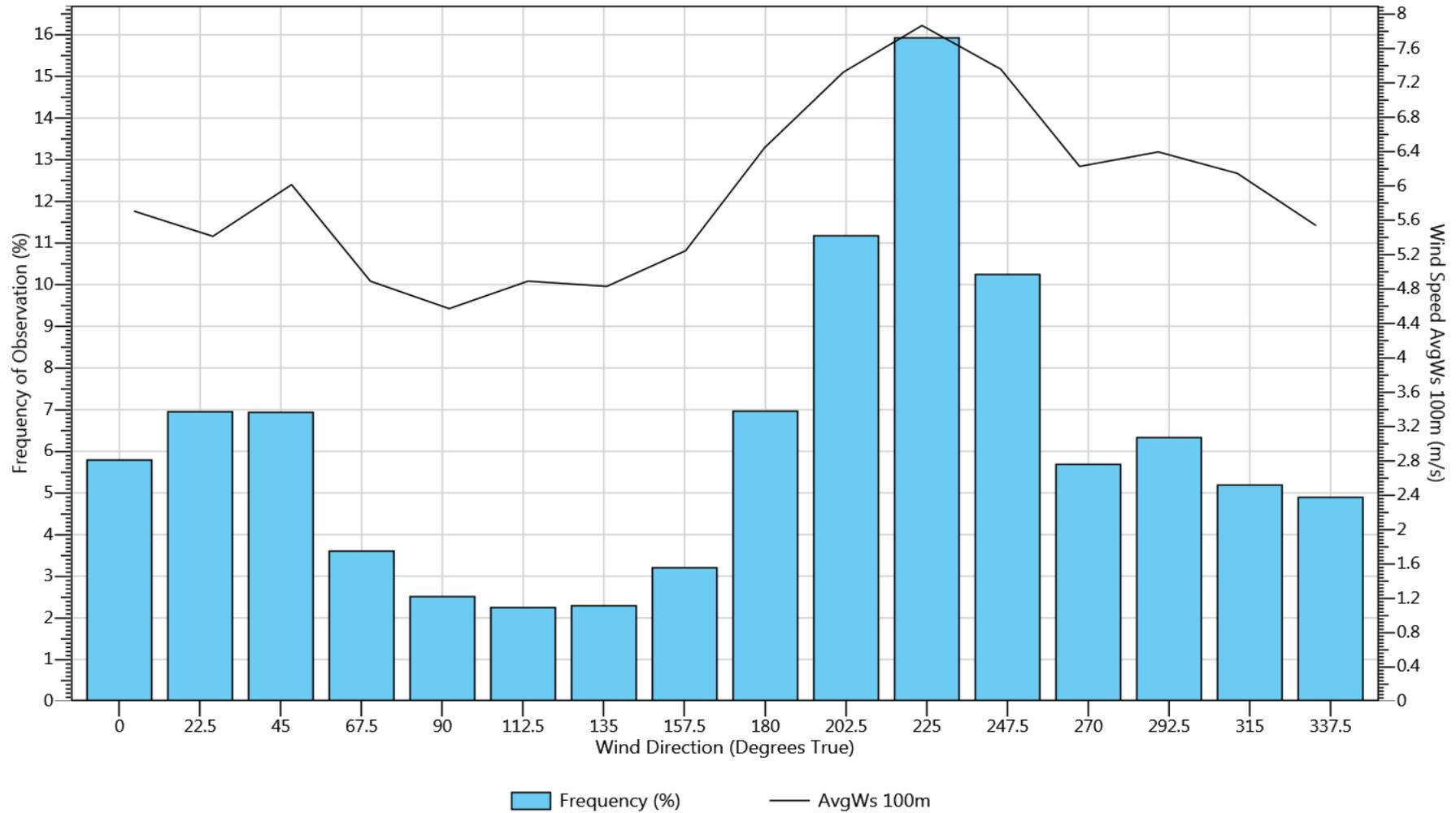
QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



Note: Vertical bar is  $\pm 1$  standard deviation.

## Wind Direction Distribution

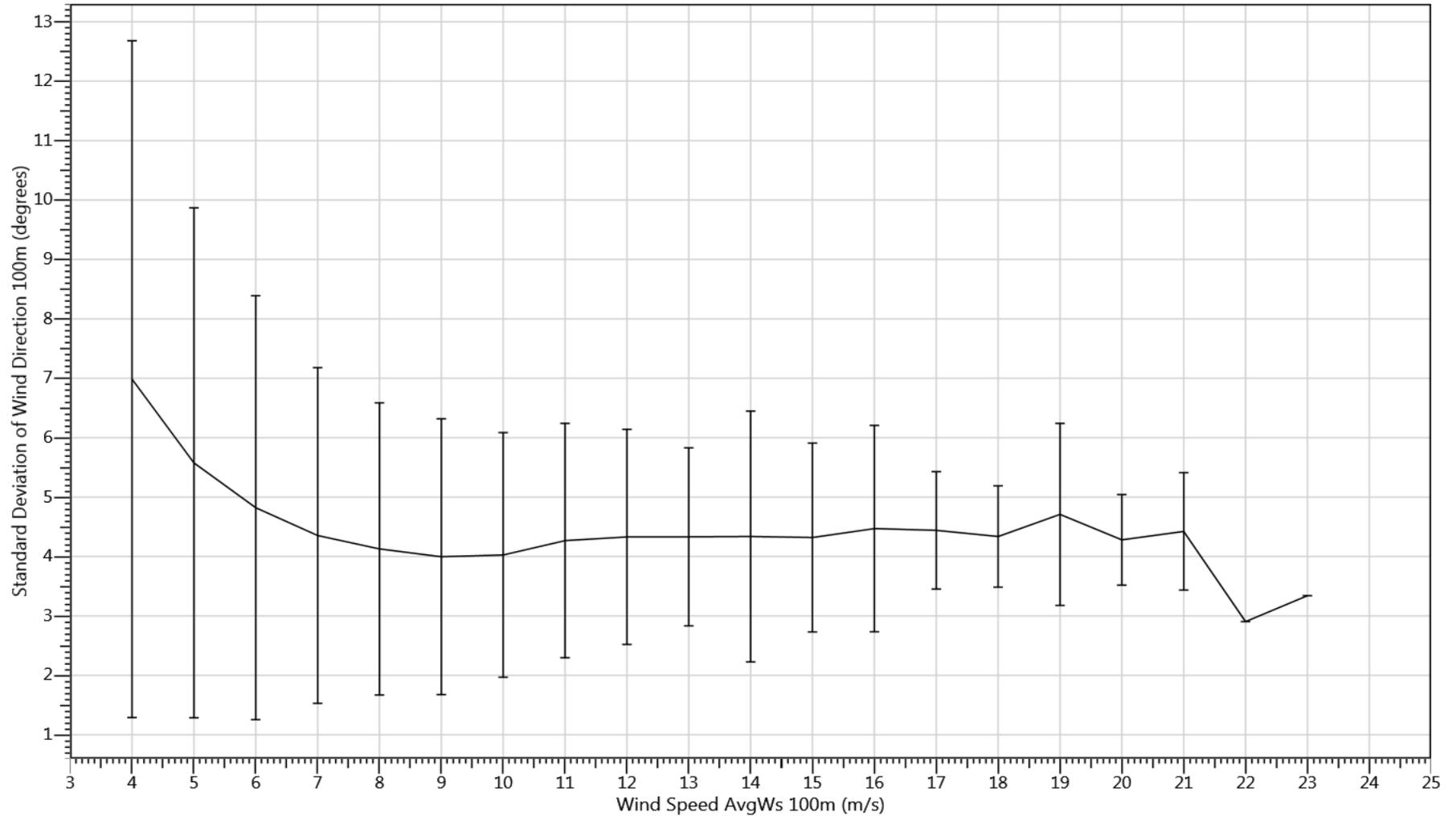
QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



Note: This chart uses the valid data from the highest available wind direction.

## Wind Direction Standard Deviation at 100m

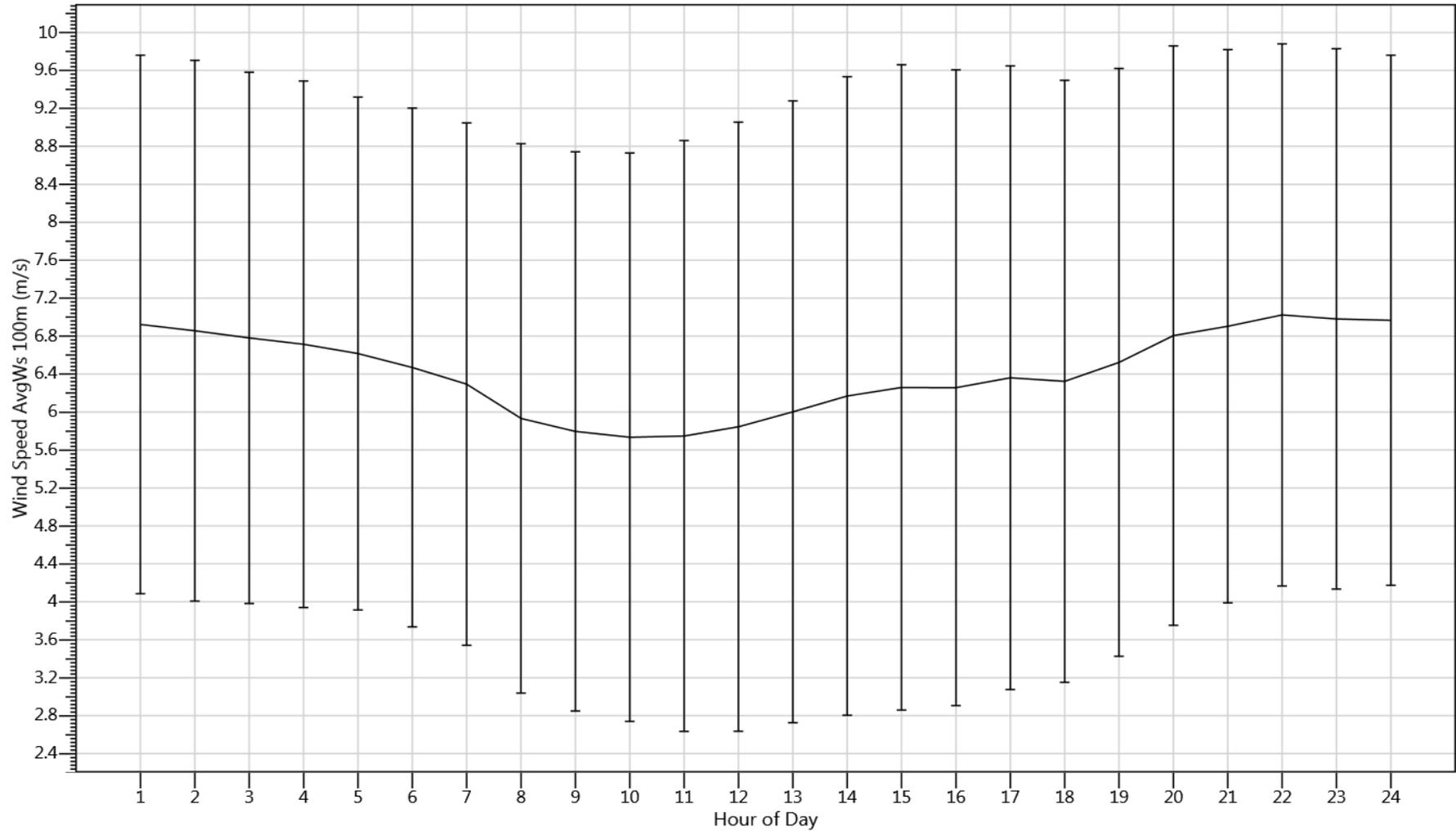
QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



Note: This chart uses the valid data from the highest available wind direction. Vertical bar is  $\pm 1$  standard deviation.

## Daily Wind Speed at 100m

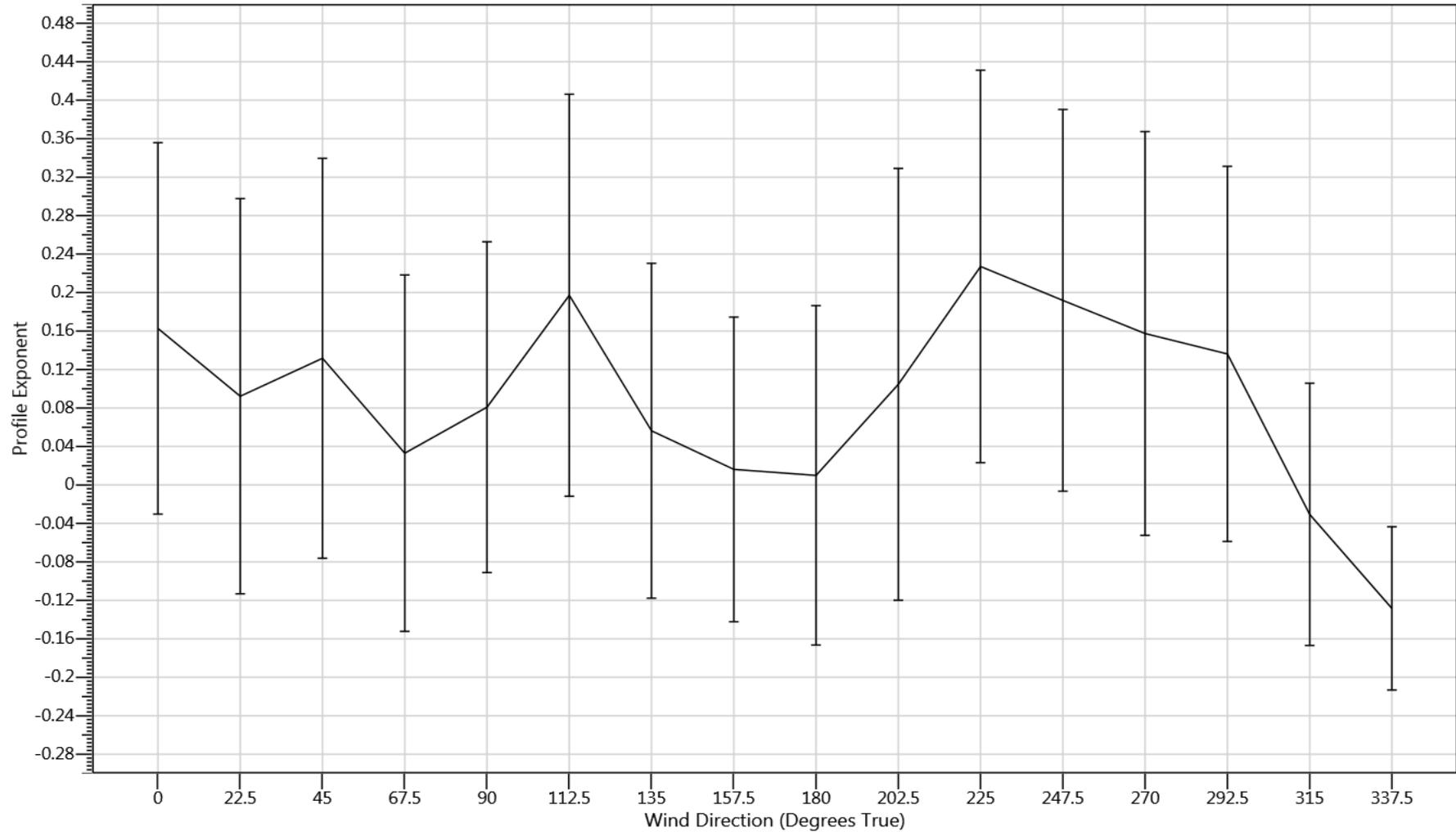
QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



Note: Vertical bar is ± 1 standard deviation.

## Profile Exponent (98m to 100m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

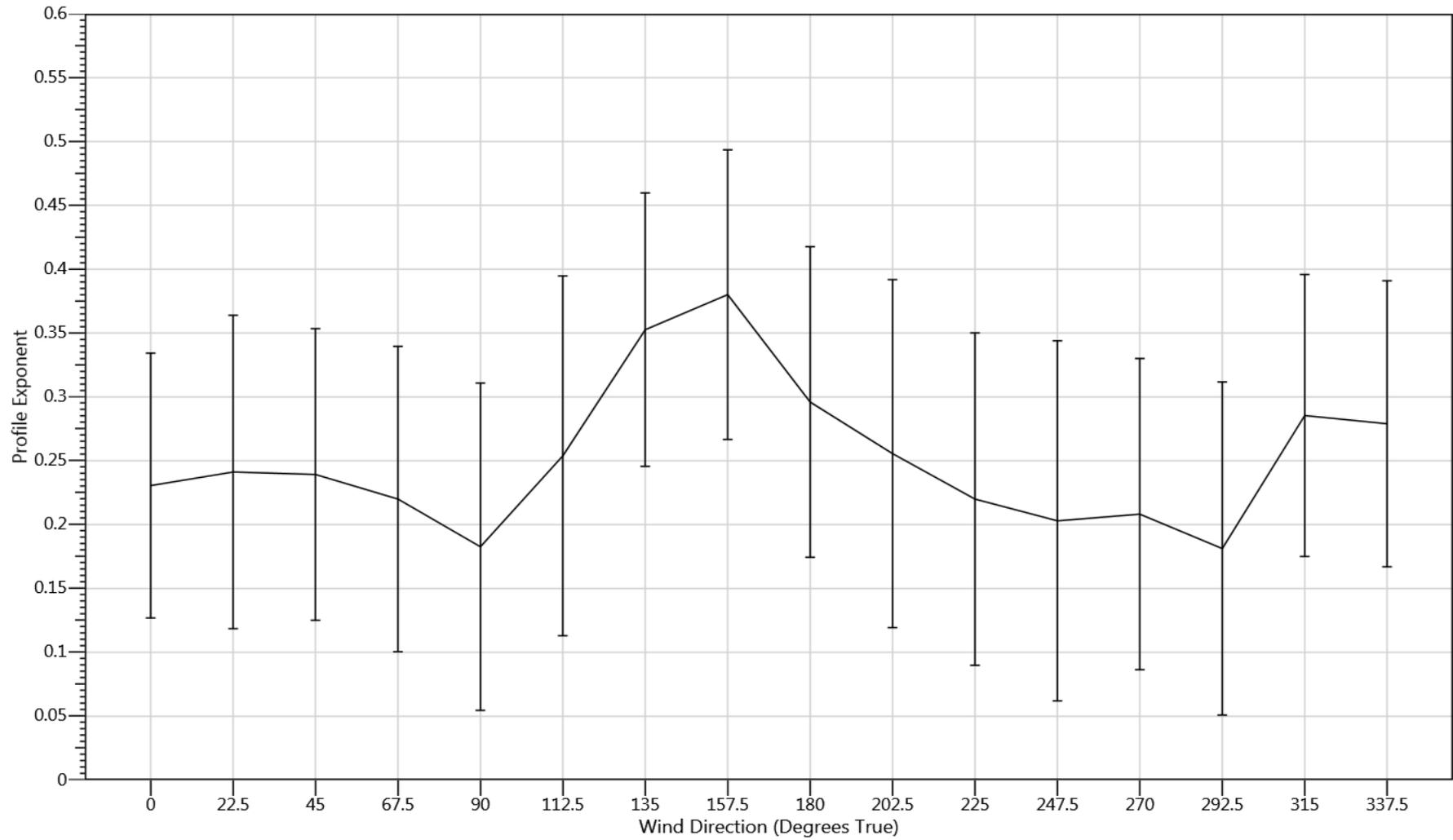


Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: This chart uses the valid data from the highest available wind direction. Vertical bar is ± 1 standard deviation.

## Profile Exponent (79m to 98m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

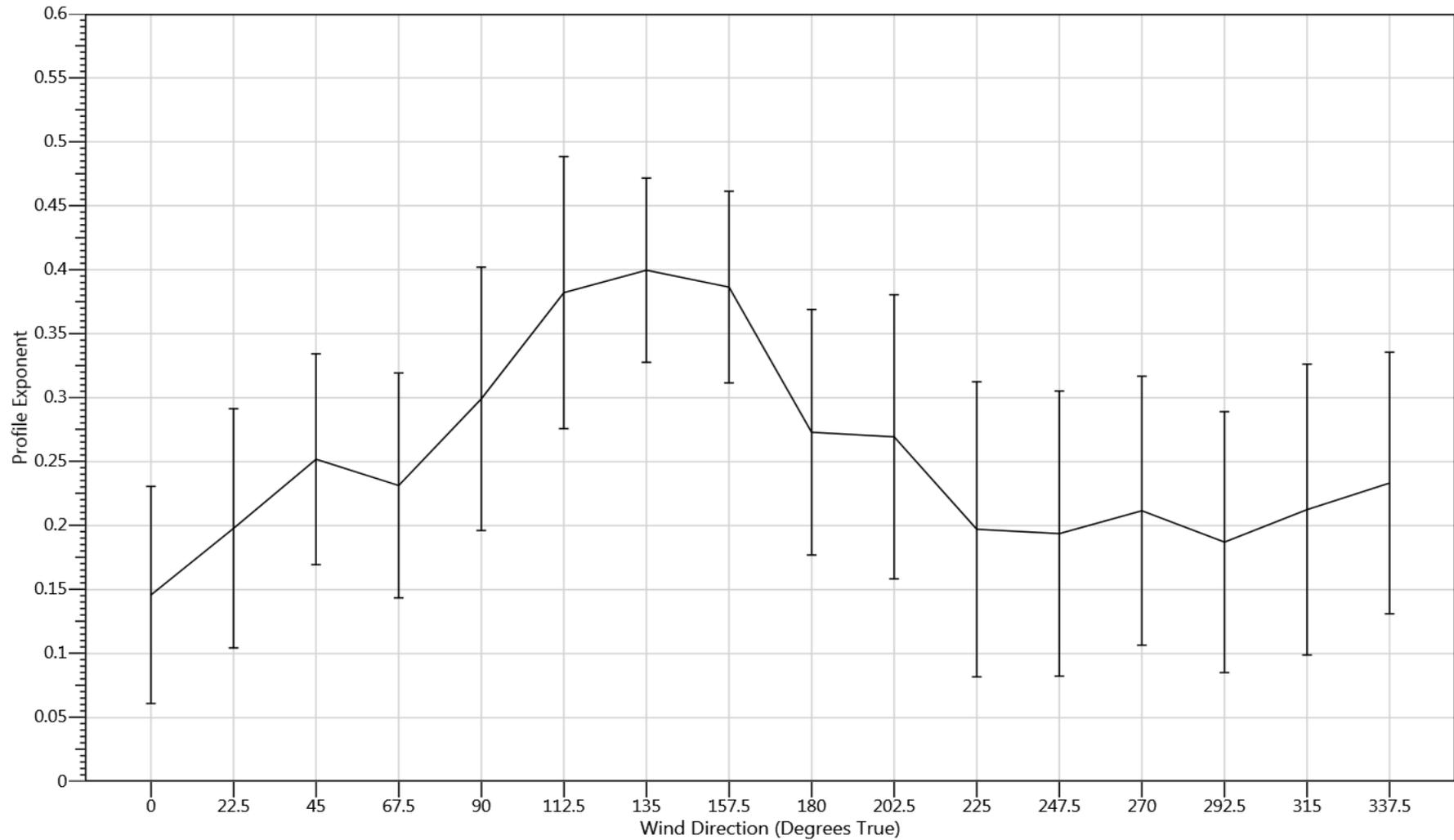


Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: This chart uses the valid data from the highest available wind direction. Vertical bar is  $\pm 1$  standard deviation.

## Profile Exponent (59m to 79m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

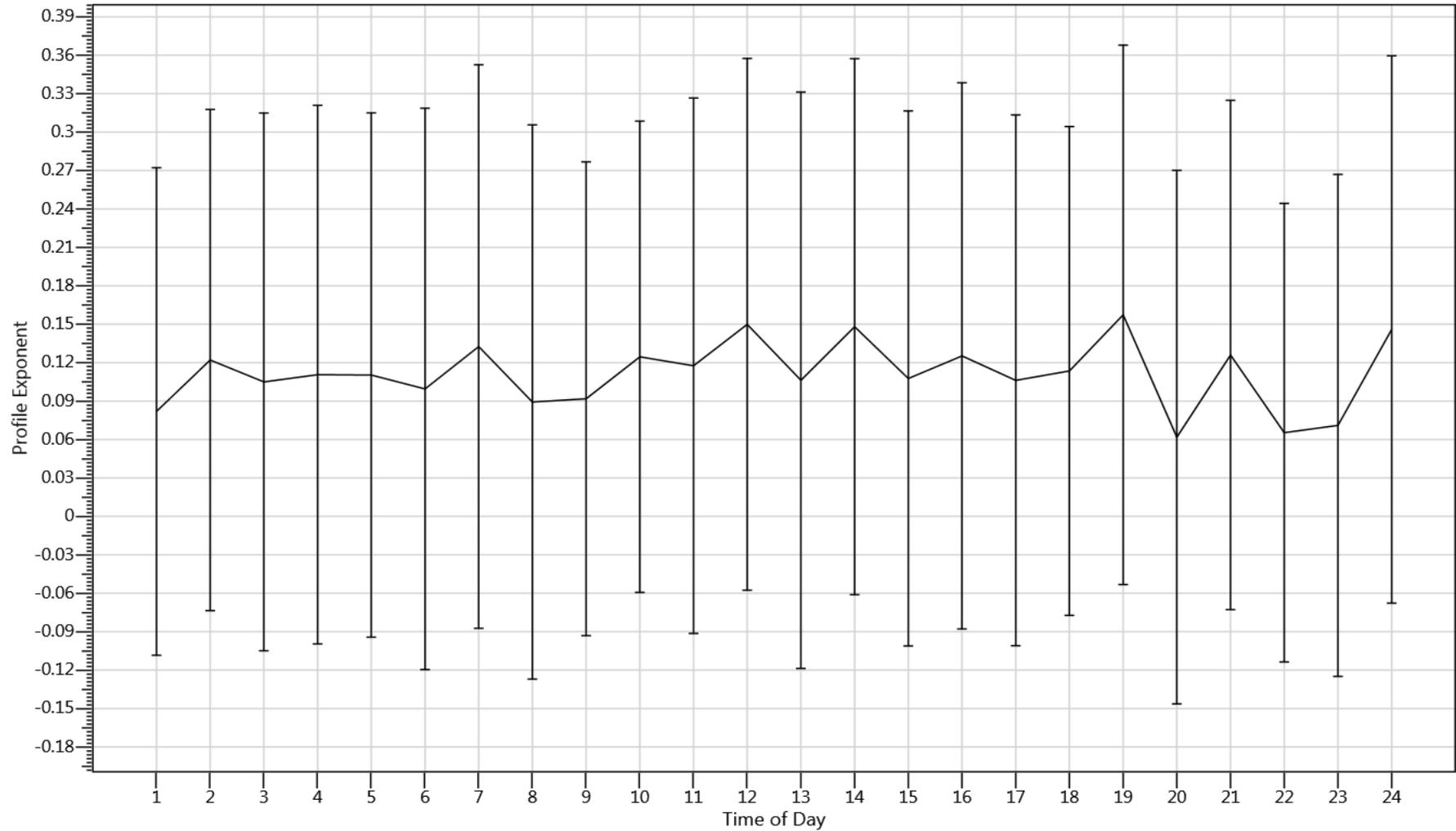


Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: This chart uses the valid data from the highest available wind direction. Vertical bar is  $\pm 1$  standard deviation.

## Profile Exponent (98m to 100m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

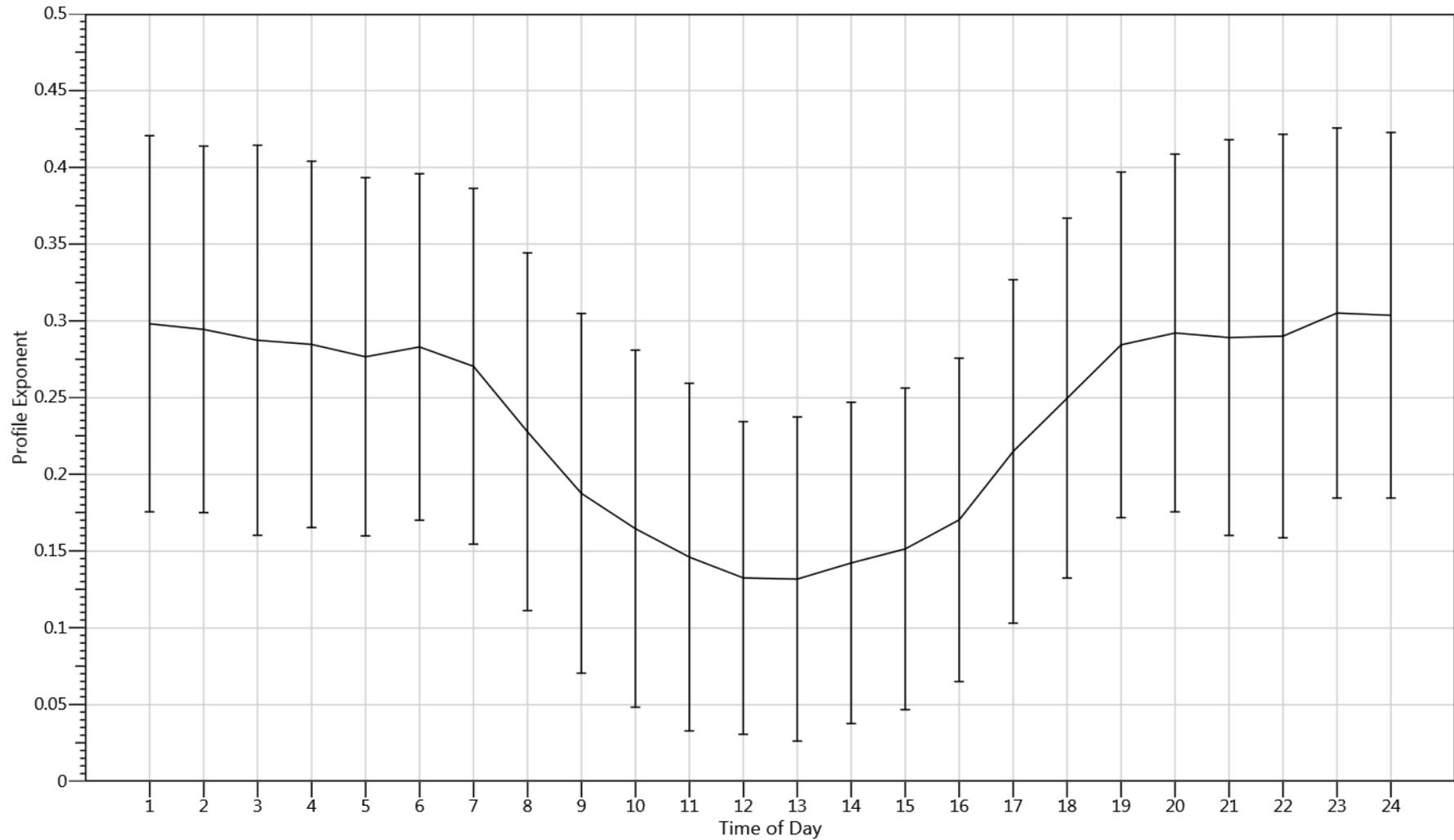


Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: Vertical bar is  $\pm 1$  standard deviation.

## Profile Exponent (79m to 98m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

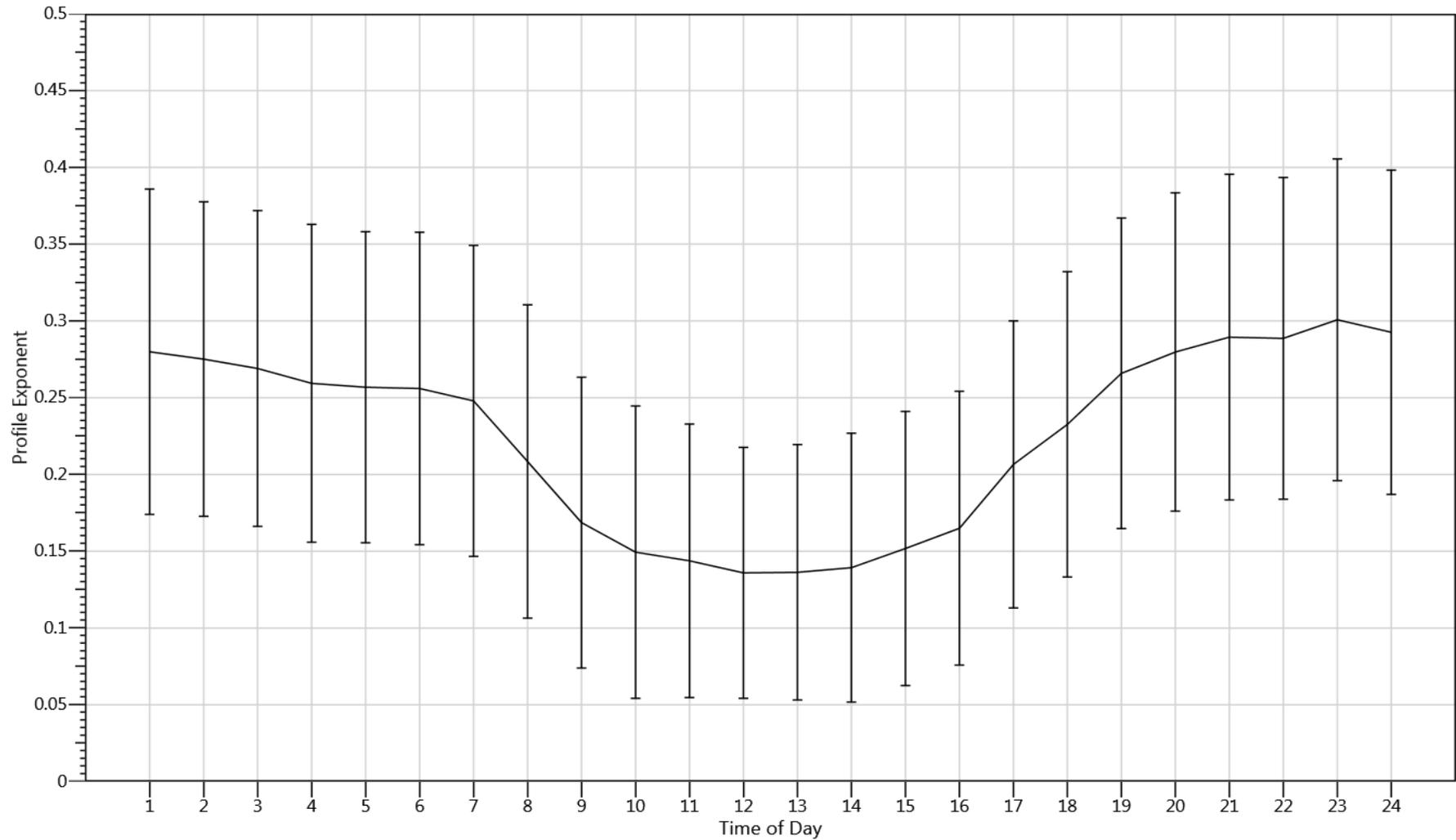


Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: Vertical bar is ± 1 standard deviation.

## Profile Exponent (59m to 79m)

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01



Where each wind speed is greater than 7m/s and the sum of the upper and lower wind speeds is greater than 14m/s.

Note: Vertical bar is  $\pm 1$  standard deviation.

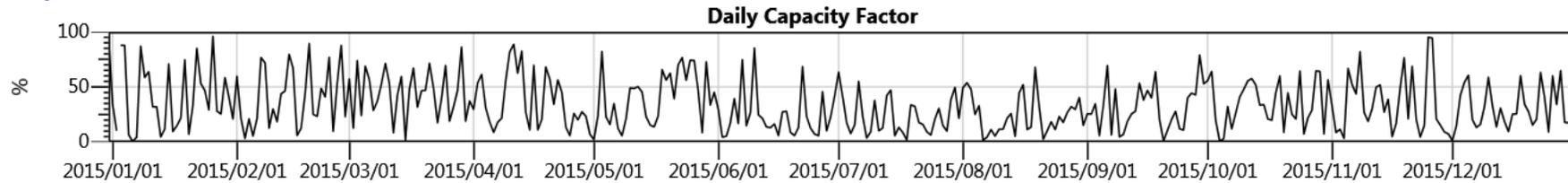
## Approximate Turbine Performance for REpower MM92-hh100

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

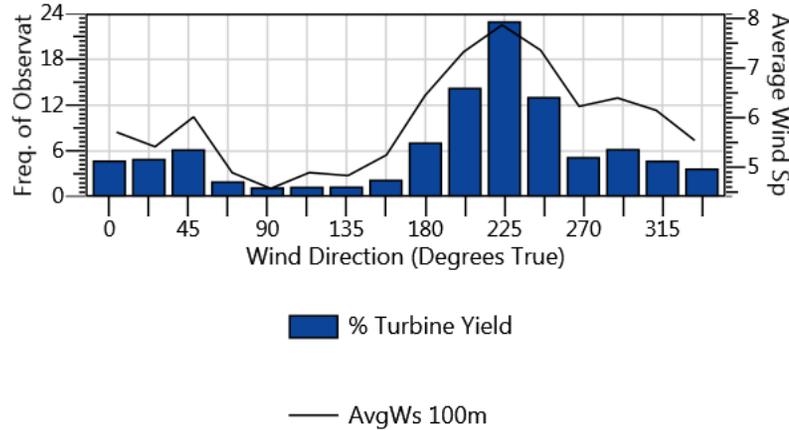
### Estimated Turbine Gross Energy Yield:

Turbine Model	Hub Height (m)	Avg WS at Hub Height (m/s)	Energy Yield (MWh)	Capacity Factor (%)	Weibull k Factor	Weibull c Factor	Weibull Energy Yield (MWh)	Weibull Capacity Factor (%)
REpower MM92-hh100	100.0	6.43	5,994.76	34.22	2.47	7.39	5,988.50	34.18

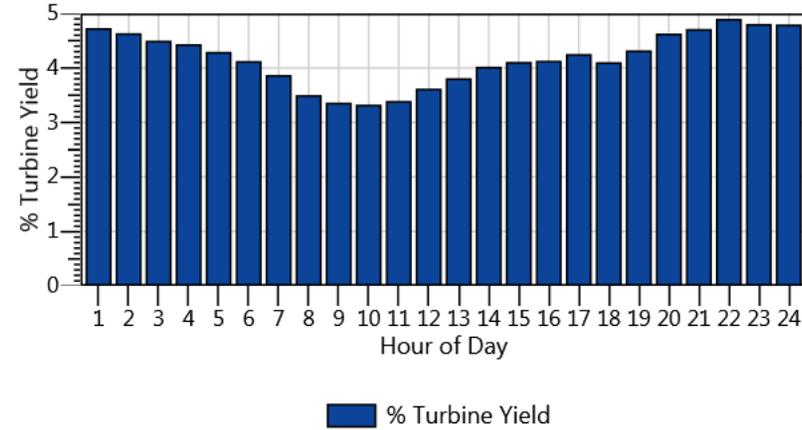
### Capacity Factor:



### Turbine Yield Distribution:



### Daily Yields:



Results shown are based on the application of a non-site-specific power curve to measured wind speeds which have been extrapolated to hub height. The results do not take into consideration any of the following: losses and inter-annual, seasonal and spatial variation of the wind resource. A detailed wind resource assessment should be performed in order to obtain results suitable for making decisions regarding project viability and uncertainty.

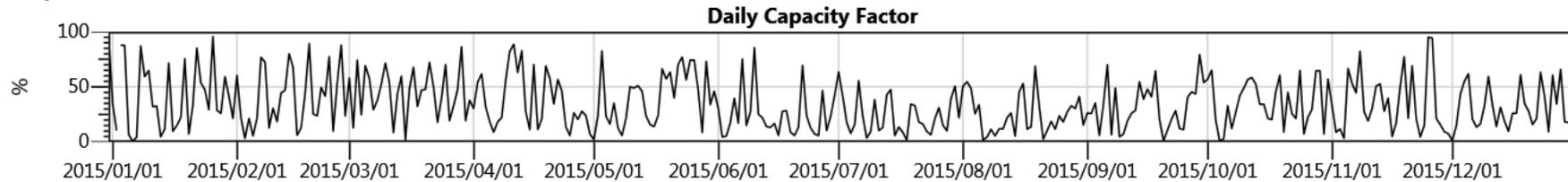
## Approximate Turbine Performance for (PDS) Servion MM92 -100 m HH

QC - Yamaska 2-100m (0092), 2015/01/01 - 2016/01/01

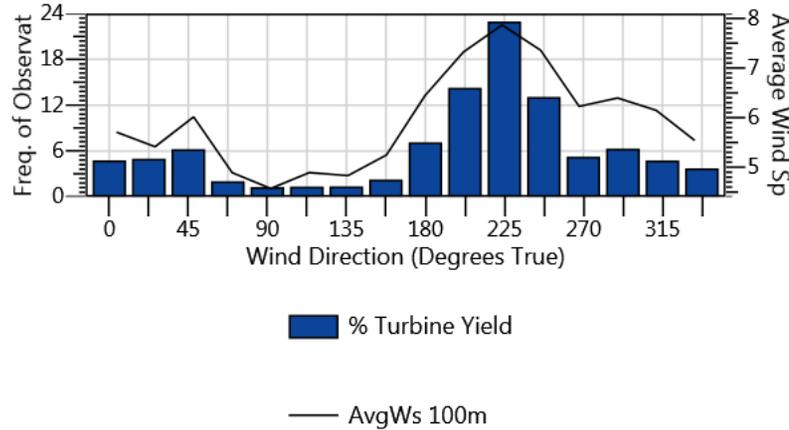
### Estimated Turbine Gross Energy Yield:

Turbine Model	Hub Height (m)	Avg WS at Hub Height (m/s)	Energy Yield (MWh)	Capacity Factor (%)	Weibull k Factor	Weibull c Factor	Weibull Energy Yield (MWh)	Weibull Capacity Factor (%)
(PDS) Servion MM92 -100 m HH	100.0	6.43	6,225.49	34.67	2.47	7.39	6,215.84	34.61

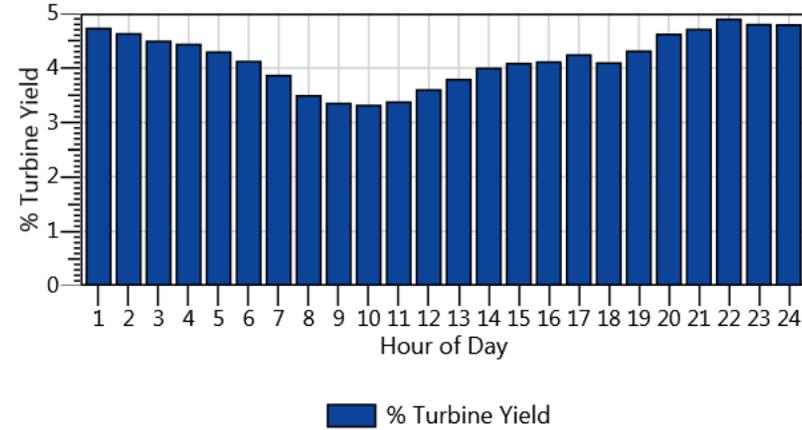
### Capacity Factor:



### Turbine Yield Distribution:



### Daily Yields:



Results shown are based on the application of a non-site-specific power curve to measured wind speeds which have been extrapolated to hub height. The results do not take into consideration any of the following: losses and inter-annual, seasonal and spatial variation of the wind resource. A detailed wind resource assessment should be performed in order to obtain results suitable for making decisions regarding project viability and uncertainty.