Table S1a. As in Table 3 (% MD), but for TWR_C. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, -229.0, -125.8	42.6, 43.6, 16.6	-15.0, -2.9, -4.8	7.4, -4.9, -16.8
$HFP_{4.8L}$	---, -229.2, -126.0	43.5, 43.8, 16.6	-15.2, -3.0, -4.6	6.9, -4.9, -16.5
HFP_{24L}	---, -227.4, -125.0	46.8, 43.3, 14.7	-14.4, -1.3, -1.9	7.3, -5.8, -16.9
HFP_{24H}	---, -227.3, -124.8	47.3, 43.6, 15.2	-14.6, -1.5, -2.5	8.2, -5.6, -16.5
HP_{400}	---, -228.8, -125.8	42.3, 43.2, 16.4	-14.9, -2.6, -4.4	7.7, -5.1, -17.0
SHF_{24}	---, -227.3, -124.8	46.1, 43.2, 14.9	-14.6, -1.6, -2.5	7.0, -6.0, -17.3
NF_0	---, -228.5, -125.5	41.1, 43.1, 16.5	-14.9, -2.9, -5.1	7.2, -5.2, -17.1
O_{max} - O_{min}	---, 1.9, 2.7	0.8, 1.4, 4.3	0.8, 0.9, 1.1	0.9, 1.4, 5.1

Table S1b. As in Table 3 (% MD), but for TWR_E.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	-7.9, -32.3, -38.3	20.5, 15.9, 13.6	-2.0, -5.7, -3.4	-4.6, -24.1, -29.0
$HFP_{4.8L}$	18.7, -20.6, -34.7	40.8, 25.6, 17.9	-0.1, -4.1, -2.7	5.2, -20.3, -27.9
HFP_{24L}	143.3, 45.0, -5.4	107.2, 74.5, 30.5	9.2, 7.7, 4.9	60.3, 15.6, -19.8
HFP_{24H}	53.9, 29.9, 12.3	120.0, 81.7, 34.9	6.0, 7.3, 8.0	60.7, 14.3, -20.1
HP_{400}	-21.9, -46.1, -35.5	12.1, 10.8, 13.2	-4.4, -7.7, -3.4	-10.8, -27.5, -28.8
SHF_{24}	181.7, 30.9, -16.2	106.8, 71.5, 28.6	8.1, 4.6, 2.3	59.4, 11.5, -22.2
NF_0	-40.2, -44.9, -42.4	-3.3, 0.8, 8.8	-3.6, -7.1, -4.2	-16.0, -28.8, -30.1
O_{max} - O_{min}	12.1, 11.3, 9.9	1.6, 1.6, 3.4	0.9, 1.5, 2.5	3.6, 3.4, 8.6

Table S1c. As in Table 3 (% MD), but for TWR_F. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, -20.6, -31.9	25.6, 6.5, 6.7	6.4, 6.4, 9.2	1.9, -22.0, -33.7
$HFP_{4.8L}$	---, -12.2, -29.6	42.5, 14.0, 9.5	7.2, 5.8, 7.6	14.2, -16.6, -32.1
HFP_{24L}	---, 35.7, -19.8	110.9, 41.6, 20.2	5.8, -0.3, -3.3	93.8, 12.3, -24.2
HFP_{24H}	---, 16.4, -10.0	104.3, 46.9, 26.6	-2.6, -4.4, -7.2	76.5, 14.3, -20.0
HP_{400}	---, -32.9, -30.9	15.4, 3.4, 7.1	3.7, 4.6, 7.6	-2.4, -23.6, -33.5
SHF_{24}	---, 27.2, -24.1	107.4, 38.5, 19.0	9.4, 1.6, -1.7	97.5, 10.8, -24.9
NF_0	---, -31.7, -35.2	2.0, -4.6, 1.5	4.2, 5.6, 8.6	-9.6, -27.1, -35.8
O_{max} - O_{min}	---, 11.7, 10.0	1.5, 2.6, 4.1	0.5, 1.5, 1.5	2.5, 4.0, 8.4

Table S1d. As in Table 3 (% MD), but for TWR_N.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	-2.0, -7.9, -28.0	28.9, 2.2, -6.5	5.6, 3.6, 3.6	0.7, -18.0, -21.7
$HFP_{4.8L}$	17.0, 0.4, -22.3	44.9, 14.4, 2.4	5.2, 3.0, 2.0	14.2, -13.7, -19.9
HFP_{24L}	93.9, 27.8, -6.8	99.5, 46.6, 17.8	-6.1, -11.7, -10.7	120.5, 17.2, -5.6
HFP_{24H}	31.3, 25.9, -0.5	102.9, 55.4, 25.9	-6.1, -13.3, -16.7	102.9, 18.2, -4.7
HP_{400}	6.0, -9.3, -28.6	27.4, -0.7, -8.2	6.4, 4.3, 3.7	6.4, -18.7, -21.9
SHF_{24}	108.7, 9.2, -13.9	106.9, 48.5, 19.9	-7.7, -14.0, -13.9	151.7, 17.8, -6.5
NF_0	-32.9, -22.4, -34.4	3.4, -13.1, -16.8	6.9, 5.5, 6.4	-16.4, -22.5, -24.7
O_{max} - O_{min}	12.0, 10.2, 8.9	1.6, 2.4, 3.6	0.8, 1.4, 1.5	1.5, 4.3, 7.2

Table S1e. As in Table 3 (% MD), but for TWR_S. Recall from section 2: no middle tower level sonic anemometer.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	-21.2, ---, -42.4	14.7, ---, -2.5	-7.0, ---, -0.5	-12.3, ---, -40.6
$HFP_{4.8L}$	-15.8, ---, -41.4	24.5, ---, 0.3	-8.6, ---, -2.7	-3.1, ---, -41.3
HFP_{24L}	17.1, ---, -41.0	50.0, ---, 8.1	-12.6, ---, -8.6	28.3, ---, -37.7
HFP_{24H}	-10.9, ---, -29.8	51.1, ---, 11.6	-13.5, ---, -9.5	23.7, ---, -36.1
HP_{400}	-18.6, ---, -42.1	9.6, ---, -4.2	-5.9, ---, 0.9	-13.5, ---, -39.5
SHF_{24}	25.9, ---, -45.0	46.9, ---, 7.7	-12.7, ---, -9.0	30.6, ---, -38.2
NF_0	-30.3, ---, -47.1	1.6, ---, -6.8	-7.2, ---, -0.6	-18.9, ---, -38.1
O_{max} - O_{min}	17.4, ---, 7.5	1.8, ---, 3.9	0.7, ---, 2.0	2.2, ---, 3.6

Table S2a. As in Table 4 (% RMSD), but for TWR_C. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, 232.0, 128.9	65.5, 58.4, 37.0	30.1, 23.7, 28.3	45.0, 36.7, 36.2
$HFP_{4.8L}$	---, 232.2, 129.0	65.9, 58.7, 37.1	30.3, 23.9, 28.5	44.3, 36.9, 36.3
HFP_{24L}	---, 230.8, 128.3	68.2, 58.6, 36.4	30.5, 24.8, 27.7	43.7, 37.5, 36.2
HFP_{24H}	---, 230.6, 128.1	68.4, 58.9, 36.6	30.6, 24.7, 27.7	44.5, 37.7, 36.2
HP_{400}	---, 231.7, 128.8	65.2, 57.9, 36.6	30.2, 23.6, 27.5	45.1, 36.6, 36.1
SHF_{24}	---, 230.6, 128.1	68.2, 58.3, 36.1	30.4, 24.6, 28.0	44.1, 37.5, 36.2
NF_0	---, 231.5, 128.6	65.3, 58.0, 36.8	29.9, 23.5, 28.0	45.1, 36.3, 36.0
O_{max} - O_{min}	---, 1.9, 2.7	0.8, 1.4, 4.3	0.8, 0.9, 1.1	0.9, 1.4, 5.1

Table S2b. As in Table 4 (% RMSD), but for TWR_E.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	27.3, 43.3, 47.4	47.4, 46.0, 37.5	21.5, 27.1, 21.2	24.4, 34.3, 37.3
$HFP_{4.8L}$	35.7, 37.2, 45.6	55.8, 48.3, 40.3	21.4, 28.1, 22.8	25.4, 31.9, 36.8
HFP_{24L}	161.4, 74.7, 38.8	112.7, 83.8, 44.1	31.8, 39.2, 26.7	72.9, 37.7, 31.5
HFP_{24H}	63.4, 49.5, 39.6	124.6, 89.6, 46.5	29.5, 39.0, 31.1	69.0, 36.6, 32.5
HP_{400}	35.4, 53.7, 43.7	42.7, 43.9, 39.2	20.5, 25.9, 20.0	26.4, 36.4, 36.8
SHF_{24}	206.5, 64.7, 41.0	112.3, 83.0, 43.8	30.2, 37.4, 27.9	66.5, 36.6, 33.6
NF_0	47.2, 51.7, 49.6	41.5, 46.9, 38.3	20.5, 26.1, 21.2	26.3, 37.2, 38.2
O_{max} - O_{min}	12.1, 11.3, 9.9	1.6, 1.6, 3.4	0.9, 1.5, 2.5	3.6, 3.4, 8.6

Table S2c. As in Table 4 (% RMSD), but for TWR_F. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, 27.5, 35.2	42.6, 36.8, 33.4	21.3, 24.4, 32.8	31.6, 39.7, 45.7
$HFP_{4.8L}$	---, 23.2, 33.7	52.5, 37.1, 32.7	23.7, 25.4, 34.4	33.9, 37.7, 45.4
HFP_{24L}	---, 62.9, 29.9	114.8, 49.9, 31.1	39.6, 30.7, 28.8	102.4, 36.3, 40.8
HFP_{24H}	---, 33.3, 18.3	107.6, 53.4, 34.6	29.3, 25.4, 27.1	82.8, 33.4, 38.3
HP_{400}	---, 36.9, 33.7	38.6, 38.1, 33.9	19.9, 21.9, 29.5	31.1, 40.4, 45.1
SHF_{24}	---, 63.9, 32.4	111.9, 47.4, 30.7	40.9, 31.4, 29.4	106.0, 36.0, 41.3
NF_0	---, 38.1, 38.2	38.7, 39.1, 34.5	20.4, 22.6, 29.3	31.8, 41.9, 46.3
O_{max} - O_{min}	---, 11.7, 10.0	1.5, 2.6, 4.1	0.5, 1.5, 1.5	2.5, 4.0, 8.4

Table S2d. As in Table 4 (% RMSD), but for TWR_N.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	19.7, 23.4, 36.7	41.1, 29.0, 38.0	20.9, 24.0, 34.3	38.7, 31.4, 33.7
$HFP_{4.8L}$	28.6, 22.6, 32.9	52.7, 31.3, 32.6	20.5, 24.4, 38.2	44.6, 29.1, 30.8
HFP_{24L}	109.3, 55.8, 48.3	108.0, 56.8, 33.6	32.3, 42.7, 61.1	147.6, 36.0, 29.9
HFP_{24H}	37.2, 32.4, 22.3	106.9, 62.3, 38.0	22.2, 28.1, 40.4	119.5, 37.3, 32.6
HP_{400}	19.1, 21.1, 35.2	41.4, 27.5, 38.2	21.3, 22.7, 31.6	43.4, 32.3, 34.2
SHF_{24}	124.5, 38.2, 39.7	115.3, 57.3, 34.5	30.0, 36.4, 49.0	174.3, 36.8, 31.3
NF_0	38.3, 32.6, 40.9	38.2, 35.8, 40.1	25.2, 25.9, 32.4	38.2, 33.1, 35.6
O_{max} - O_{min}	12.0, 10.2, 8.9	1.6, 2.4, 3.6	0.8, 1.4, 1.5	1.5, 4.3, 7.2

Table S2e. As in Table 4 (% RMSD), but for TWR_S. Recall from section 2: no middle tower level sonic anemometer.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	29.7, ---, 49.1	34.9, ---, 32.8	21.3, ---, 22.7	29.4, ---, 52.4
$HFP_{4.8L}$	25.2, ---, 47.8	37.8, ---, 31.6	21.9, ---, 20.8	24.7, ---, 53.2
HFP_{24L}	40.6, ---, 46.3	59.6, ---, 32.2	27.2, ---, 21.8	52.9, ---, 52.3
HFP_{24H}	21.6, ---, 40.8	60.1, ---, 32.0	26.6, ---, 20.7	45.1, ---, 51.0
HP_{400}	26.4, ---, 50.0	35.8, ---, 34.1	21.3, ---, 24.4	30.8, ---, 51.4
SHF_{24}	51.7, ---, 49.3	56.7, ---, 32.4	28.0, ---, 22.3	57.0, ---, 52.7
NF_0	39.8, ---, 52.4	39.8, ---, 36.9	22.1, ---, 21.8	37.5, ---, 51.2
O_{max} - O_{min}	17.4, ---, 7.5	1.8, ---, 3.9	0.7, ---, 2.0	2.2, ---, 3.6

Table S3a. As in Table 5 (IA), but for TWR_C. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, 0.14, 0.19	0.27, 0.25, 0.26	0.36, 0.30, 0.37	0.27, 0.24, 0.33
$HFP_{4.8L}$	---, 0.14, 0.19	0.27, 0.25, 0.25	0.36, 0.30, 0.36	0.26, 0.23, 0.33
HFP_{24L}	---, 0.14, 0.19	0.24, 0.22, 0.30	0.32, 0.32, 0.43	0.22, 0.20, 0.35
HFP_{24H}	---, 0.14, 0.19	0.25, 0.22, 0.29	0.33, 0.31, 0.42	0.23, 0.20, 0.34
HP_{400}	---, 0.14, 0.19	0.28, 0.25, 0.27	0.36, 0.31, 0.41	0.27, 0.24, 0.34
SHF_{24}	---, 0.14, 0.19	0.24, 0.22, 0.29	0.33, 0.31, 0.40	0.23, 0.21, 0.35
NF_0	---, 0.14, 0.19	0.27, 0.25, 0.25	0.37, 0.30, 0.37	0.27, 0.25, 0.33

Table S3b. As in Table 5 (IA), but for TWR_E.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	0.39, 0.38, 0.38	0.39, 0.36, 0.35	0.22, 0.32, 0.34	0.43, 0.46, 0.45
$HFP_{4.8L}$	0.48, 0.35, 0.36	0.40, 0.40, 0.32	0.15, 0.22, 0.22	0.47, 0.47, 0.45
HFP_{24L}	0.15, 0.17, 0.46	0.29, 0.31, 0.32	0.27, 0.36, 0.50	0.23, 0.27, 0.47
HFP_{24H}	0.32, 0.24, 0.31	0.25, 0.32, 0.33	0.19, 0.23, 0.30	0.28, 0.29, 0.45
HP_{400}	0.36, 0.37, 0.39	0.38, 0.33, 0.23	0.25, 0.29, 0.25	0.40, 0.45, 0.47
SHF_{24}	0.13, 0.20, 0.39	0.28, 0.31, 0.32	0.27, 0.32, 0.36	0.33, 0.27, 0.43
NF_0	0.37, 0.38, 0.38	0.35, 0.30, 0.31	0.20, 0.29, 0.28	0.42, 0.45, 0.45

Table S3c. As in Table 5 (IA), but for TWR_F. Recall from Sect. 4.3 that lower tower level *T* is masked.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	---, 0.52, 0.33	0.31, 0.30, 0.37	0.69, 0.47, 0.38	0.19, 0.38, 0.46
$HFP_{4.8L}$	---, 0.67, 0.36	0.34, 0.29, 0.40	0.66, 0.47, 0.35	0.24, 0.37, 0.45
HFP_{24L}	---, 0.26, 0.43	0.25, 0.41, 0.54	0.41, 0.47, 0.59	0.25, 0.47, 0.47
HFP_{24H}	---, 0.49, 0.64	0.26, 0.40, 0.53	0.56, 0.57, 0.66	0.29, 0.51, 0.49
HP_{400}	---, 0.43, 0.34	0.30, 0.28, 0.37	0.65, 0.49, 0.43	0.22, 0.39, 0.47
SHF_{24}	---, 0.26, 0.38	0.25, 0.42, 0.53	0.41, 0.45, 0.56	0.25, 0.45, 0.46
NF_0	---, 0.39, 0.31	0.32, 0.29, 0.34	0.60, 0.43, 0.42	0.24, 0.37, 0.47

Table S3d. As in Table 5 (IA), but for TWR_N.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	0.60, 0.60, 0.41	0.45, 0.23, 0.26	0.53, 0.53, 0.38	0.34, 0.41, 0.44
$HFP_{4.8L}$	0.58, 0.76, 0.53	0.42, 0.30, 0.35	0.63, 0.65, 0.46	0.18, 0.34, 0.47
HFP_{24L}	0.23, 0.49, 0.44	0.28, 0.31, 0.49	0.54, 0.51, 0.38	0.14, 0.30, 0.30
HFP_{24H}	0.52, 0.66, 0.72	0.30, 0.29, 0.40	0.67, 0.64, 0.52	0.20, 0.30, 0.31
HP_{400}	0.75, 0.69, 0.45	0.43, 0.30, 0.30	0.50, 0.53, 0.38	0.31, 0.43, 0.45
SHF_{24}	0.21, 0.61, 0.50	0.25, 0.31, 0.41	0.47, 0.51, 0.42	0.13, 0.31, 0.35
NF_0	0.38, 0.40, 0.39	0.38, 0.17, 0.32	0.29, 0.35, 0.31	0.34, 0.43, 0.43

Table S3e. As in Table 5 (IA), but for TWR_S. Recall from section 2: no middle tower level sonic anemometer.

Simulation	*T*	*WS*	*VV*	*TKE*
$HFP_{2.4L}$	0.55, ---, 0.37	0.52, ---, 0.42	0.57, ---, 0.48	0.55, ---, 0.40
$HFP_{4.8L}$	0.68, ---, 0.38	0.58, ---, 0.43	0.54, ---, 0.53	0.77, ---, 0.40
HFP_{24L}	0.72, ---, 0.42	0.49, ---, 0.41	0.45, ---, 0.55	0.64, ---, 0.38
HFP_{24H}	0.80, ---, 0.45	0.50, ---, 0.47	0.48, ---, 0.62	0.68, ---, 0.39
HP_{400}	0.65, ---, 0.36	0.47, ---, 0.41	0.57, ---, 0.42	0.49, ---, 0.41
SHF_{24}	0.65, ---, 0.40	0.50, ---, 0.40	0.41, ---, 0.53	0.61, ---, 0.37
NF_0	0.43, ---, 0.36	0.33, ---, 0.38	0.47, ---, 0.46	0.39, ---, 0.39