A High Wind in Florida
Potential Effects of High Wind Conditions in AERMOD

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Florida DEP

Source Characteristics

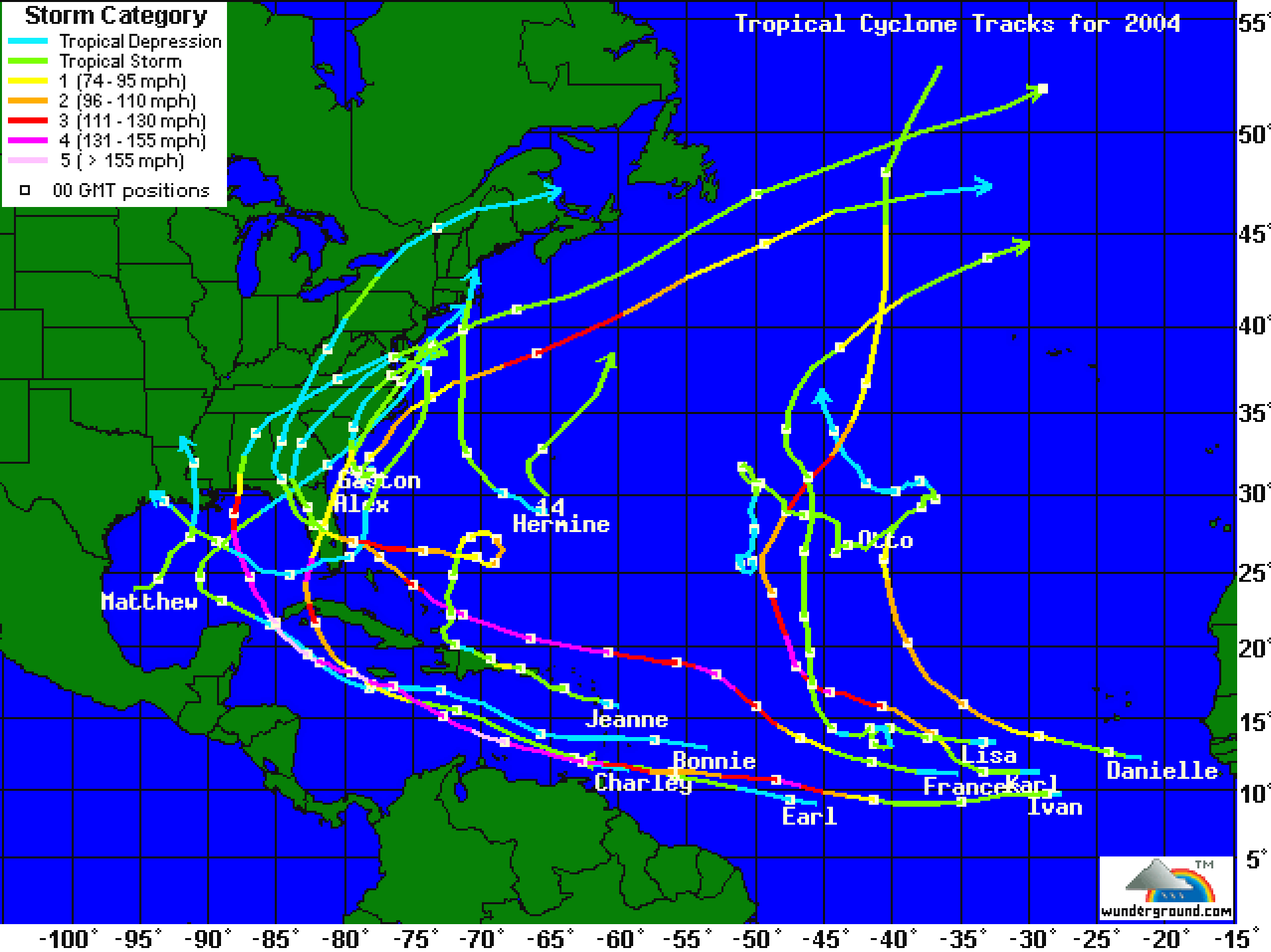
- Combusion Turbine
- Stack Height 18.3 m
- Stack Diameter 6.7 m
- Gas Temp. 846 K
- Exit Velocity 35.7 m/s
- Emission Rate 10 g/s

Meteorological Data

- 2001-2005 Orlando Surface/Tampa Upper Air

AERMOD Results

Year	H1	HSH1	H3	HSH3	H24	HSH24
2001	2.9	2.3	1.9	1.7	0.65	0.46
2002	2.4	2.1	1.8	1.6	0.52	0.42
2003	2.8	2.4	1.9	1.5	0.44	0.38
2004	40.2	16.8	18.4	7.7	3.1	2.7
2005	2.7	2.5	2.1	1.6	0.56	0.49


Tropical Cyclone Tracks for 2004
Storm Category
Tropical Depression
Tropical Storm
1 (74 - 95 mph)
2 (96 - 110 mph)
3 (111 - 130 mph)
4 (131 - 155 mph)
5 (> 155 mph)
00 GMT positions
Gaston
Alex
14
Hermine
Otto
Matthew
Jeanne
Bonnie
Charley
Earl
Lisa
France
Karl
Ivan
Danielle
55°
50°
45°
40°
35°
30°
25°
20°
15°
10°
5°
-100° -95° -90° -85° -80° -75° -70° -65° -60° -55° -50° -45° -40° -35° -30° -25° -20° -15°
wunderground.com

Max Conc.	u (m/s)	Hurricane
40.18	27.3	Charley
24.43	24.2	Jeanne
19.12	20.6	Jeanne
16.85	21.6	Frances
16.85	21.6	Jeanne
16.68	25.2	Jeanne
10.28	17.5	Frances
9.37	16.5	Frances
8.73	15.9	Jeanne
8.65	17	Frances
8.07	21.1	Jeanne
7.85	21.6	Frances
7.85	15.4	Jeanne
7.83	17.5	Jeanne
7.82	17.5	Frances
7.47	21.6	Jeanne
7.20	15.9	Frances
7.04	21.6	Charley

Max Conc.	u (m/s)	Hurricane
6.50	17.5	Jeanne
6.40	14.9	Frances
5.93	20.6	Jeanne
5.79	24.7	Jeanne
5.62	13.9	Frances
5.61	17	Jeanne
5.33	13.9	Frances
5.12	13.9	Jeanne
5.02	15.4	Jeanne
4.36	13.4	Jeanne
4.09	20.6	Jeanne
4.00	11.3	Jeanne
3.91	13.4	Frances
3.59	18	Frances
3.45	14.9	Frances
3.41	14.4	
3.32	16.5	Frances
3.31	13.4	Jeanne

Max Conc.	u (m/s)	Hurricane
3.05	11.8	Frances
3.01	17	Jeanne
2.88	11.8	Frances
2.67	13.9	Frances
2.62	13.4	Frances
2.59	21.6	Frances
2.57	12.9	Frances
2.53	14.9	Jeanne
2.50	13.4	
2.47	11.8	
2.43	14.9	Jeanne
2.40	9.3	
2.36	11.3	Jeanne
2.33	11.3	Jeanne
2.24	8.2	
2.23	7.2	
2.21	7.7	
2.18	9.3	
2.15	10.8	Jeanne
2.15	10.3	Frances

Stack Tip Downwash

	Stacktip	No Stacktip
Rank	Conct	Conct
1	40.18	19.83
2	24.43	18.71
3	23.34	16.84
4	22.93	14.16
5	19.12	14.16
6	16.85	12.88
7	16.85	10.48
8	16.68	10.28
9	13.87	10.21
10	10.48	9.37
11	10.28	8.85
12	9.43	8.76
13	9.37	8.73
14	9.04	8.65
15	8.85	7.85

More “Normal” Stack Parameters

HS: 15m, TS=350K, VS=11.7m/s, DS=2.4m

HS: 35m, TS:400K, VS:11.7m/s, DS:2.4m

HS: 65m, TS:425K, VS:15m/s, DS:5m

HS (m)	2004	2005
15	379.9	240.4
15	378.6	238.0
15	374.1	236.3
15	372.3	235.5
15	372.1	235.0
35	46.1	45.3
35	45.4	43.5
35	45.0	43.4
35	44.3	43.3
35	43.9	43.1
65	9.0	7.1
65	8.9	7.0
65	8.8	7.0
65	8.8	7.0
65	8.7	6.9

Policy Options

- No change: use high wind data as normal
- Treat high wind (u>xx m/s) as missing or in the same manner as calms
- Use as normal but flag hurricane days as exceptional meteorological event and not use for regulatory restriction
- Avoid using years in which hurricanes unduly influence the AERMOD results