An Exercise in Forecasting Convection Along the FL West Coast

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The Setup - Get Into Groups!



- A NWS Meteorologist
- A Pilot
- A Transportation Official (i.e. airport authority, DOT, airline rep)

Groups should contain 8-10 People

Get to Know Your Group!

Get to Know Your Group!

- What's one thing you all have in common?
 - Can't be that you like weather!

Groups should contain 8-10 People

Background

You're an NWS Meteorologist!



- NWS Tampa Bay
- 24/7 Operations
- Seven TAF sites
 - 6 w/commercial passenger and/or cargo service
 - 5 serving 2+ million passengers per year
 - Avg 250-500 aircraft ops per day per airport
 - 1 FAA Core 30 Airport

Tampa International Airport (KTPA)



- 22 Million Passengers (2022)
- 580+ Daily Aircraft Ops
- 3 Runways
- 24/7 ATC Service, Wx Observers
- 30-Hour TAF (3-hr AMD)
- Prefer South Flow



The Summertime Case July Morning, 8AM

Observations - Satellite 8AM





500 mb (~18kft) Winds/Heights

Observations - Satellite 8AM





Observations - The Climatological Context

Regime #6: Moderate S/SE Flow Valid Time: 0600 to 0600 UTC / 2AM to 2AM EDT





South/Southeast 4 > flow < 11 knots

458 Total Days in Climatology

Forecast - Weather Model Storm Depiction (HRRR)



Forecast - Gridded Model Data (GFS LAMP)

КТРА	A TAMPA								GF:	5 L/	AMP														
UTC	Ø 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00	01	02	03	04	05	06	07	<u>08</u>	09
TMP	78	78	78	79	82	85	87	89	90	91	91	91	91	90	89	87	85	84	82	82	80	79	79	78	78
DPT	73	74	74	74	75	74	73	72	71	71	71	70	70	70	70	71	71	71	71	72	72	72	72	72	72
WDR	06	07	07	08	0 9	11	12	13	16	19	22	24	26	28	30	33	01	03	05	06	07	08	07	07	07
WSP	03	03	03	03	05	06	07	07	07	07	07	08	08	08	07	07	05	05	04	03	03	03	03	03	03
WGS	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
PPO	1	1	1	2	2	2	3	3	3	4	4	4	4	3	3	2	3	2	2	1	1	1	0	0	0
PCO	N	N	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	Ν
P01	0	0	0	1	1	2	2	3	3	4	10	11	11	11	11	22	12	4	3	2	1	1	1	1	1
PC1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N	N	N
P06										7						39						24			
P06 LP1	0	0	0	1	2	3	4	7	11	7 8	9	10	12	12	12	39 13	11	8	6	2	1	24 1	0	0	0
P06 LP1 LC1	0 N	ØN	0 N	1 N	2 N	3 N	4 N	7 N	11 N	7 8 N	9 N	10 N	12 N	12 N	12 N	39 13 L	11 L	8 N	6 N	2 N	1 N	24 1 N	0 N	0 N	0 N
PØ6 LP1 LC1 CP1	0 N 1	0 N 1	0 N 1	1 N 1	2 N 2	3 N 3	4 N 4	7 N 4	11 N 5	7 8 N 9	9 N 16	10 N 22	12 N 24	12 N 23	12 N 19	39 13 L 20	11 L 16	8 N 12	6 N 9	2 N 6	1 N 5	24 1 N 3	0 N 2	0 N 1	0 N 0
P06 LP1 LC1 CP1 CC1	0 N 1 N	0 N 1 N	0 N 1 N	1 N 1 N	2 N 2 N	3 N 3 N	4 N 4 N	7 N 4 N	11 N 5 N	7 8 9 N	9 N 16 L	10 N 22 L	12 N 24 L	12 N 23 L	12 N 19 L	39 13 L 20 L	11 L 16 L	8 N 12 N	6 N 9 N	2 N 6 N	1 N 5 N	24 1 N 3 N	0 N 2 N	0 N 1 N	0 N 0 N
P06 LP1 LC1 CP1 CC1 CLD	0 N 1 N SC	0 N 1 N SC	0 N 1 N SC	1 N 1 N SC	2 N 2 N SC	3 N 3 N SC	4 N 4 N SC	7 N 4 N BK	11 N 5 N BK	7 8 9 N 8K	9 N 16 L BK	10 N 22 L OV	12 N 24 L BK	12 N 23 L BK	12 N 19 L BK	39 13 20 L 0V	11 L 16 L BK	8 N 12 N OV	6 N 9 N 0V	2 N 6 N BK	1 N 5 N BK	24 1 3 N BK	0 N 2 N BK	Ø N 1 N BK	0 N 0 N SC
P06 LP1 LC1 CP1 CC1 CLD CLD	0 N 1 SC 8	0 N 1 SC 8	0 N 1 SC 8	1 N 1 SC 8	2 N 2 N SC 8	3 N 3 N SC 8	4 N 4 SC 8	7 N 4 N BK 8	11 N 5 N BK 8	7 8 9 N 8K 8	9 N 16 L BK 8	10 N 22 L OV 8	12 N 24 L BK 8	12 N 23 L BK 8	12 N 19 L BK 8	39 13 20 L 0V 8	11 L 16 L BK 8	8 N 12 N OV 8	6 N 9 N 0V 8	2 N 6 N BK 8	1 N 5 N 8K 8	24 1 3 N BK 8	0 N 2 N BK 8	0 N 1 BK 8	0 N 0 N SC 8
P06 LP1 LC1 CP1 CC1 CLD CLD CIG CCG	0 N 1 SC 8 8	0 N 1 SC 8 8	0 N 1 SC 8 8	1 N 1 SC 8 8	2 N 2 SC 8 8	3 N 3 SC 8 8	4 N 4 SC 8 8	7 N 4 N 8K 8 8	11 N 5 N BK 8 8	7 8 9 8 8 8 8	9 N 16 L BK 8 8	10 N 22 L OV 8 8	12 N 24 BK 8 8	12 N 23 L BK 8 8	12 N 19 L BK 8 8	39 13 20 L 0V 8 8	11 L 16 BK 8 8	8 N 12 N OV 8 8	6 N 9 N 0V 8 8	2 N 6 N 8K 8	1 N 5 N 8K 8	24 1 3 N BK 8 8	0 N 2 N 8K 8 8	0 N 1 BK 8 8	0 N 0 SC 8 8
P06 LP1 LC1 CP1 CC1 CLD CIG CCG VIS	0 N 1 SC 8 8 7	0 N SC 8 7	0 N 1 SC 8 7	1 N SC 8 7	2 N 2 SC 8 7	3 N 3 SC 8 7	4 N SC 8 7	7 N 4 N 8K 8 7	11 N 5 N BK 8 7	7 8 9 N 8K 8 7	9 N 16 BK 8 7	10 N 22 L OV 8 7	12 N 24 BK 8 7	12 N 23 L BK 8 7	12 N 19 L BK 8 7	39 13 20 L 0V 8 7	11 16 L BK 8 7	8 N 12 N OV 8 7	6 9 N 0V 8 7	2 N BK 8 7	1 5 N 8K 8 7	24 1 3 N BK 8 7	0 N 2 N 8K 8 7	0 N 1 BK 8 7	0 N 0 SC 8 7
P06 LP1 LC1 CP1 CC1 CLD CIG CCG VIS CVS	0 N 1 SC 8 7 7	0 N SC 8 7 7	0 N 1 SC 8 7 7	1 N SC 8 7 7	2 N SC 8 7 7	3 N SC 8 7 7	4 N SC 8 7 7	7 N 4 BK 8 8 7 7	11 N 5 N 8K 8 7 7	7 8 9 N 8 8 7 7	9 N 16 BK 8 7 7	10 N 22 L 0V 8 7 7	12 N 24 BK 8 7 7	12 N 23 L BK 8 7 7	12 N 19 L BK 8 7 7	39 13 20 L 0V 8 7 7	11 16 L BK 8 7 7	8 N 12 N 0V 8 7 7	6 N 9 N 0V 8 7 7	2 N BK 8 7 7	1 5 N 8K 8 7 7	24 N 3 N 8K 8 7 7	0 N 2 N 8 8 7 7	0 N 1 BK 8 7 7	0 N SC 8 7 7

Forecast - Official Rain Chances



Forecast - TAF Formatter

KTPA 001110Z 0012/0118 VRB03KT P6SM FEW030 FEW250 FM241800 14008KT P6SM FEW030 FEW250 FM242000 23008KT P6SM FEW030 SCT250 FM242200 29008KT P6SM FEW030 SCT250 FM242300 33008KT P6SM FEW035 SCT250 FM250000 05008KT P6SM SCT035 BKN250=

Forecast - Valid 09Z AMD TAF

KTPA 000522Z 2209/2312 VRB03KT P6SM SCT050 SCT250 FM221500 19006KT P6SM FEW035 BKN250 FM221800 20008KT P6SM VCTS SCT040CB SCT200 FM222000 26009KT P6SM VCTS SCT035CB SCT250 FM230000 31007KT P6SM VCTS SCT035CB SCT200 FM230200 11006KT P6SM SCT040 BKN200=

Discussion Time

Work off the 09Z TAF

- What do you like?
- What would you change?
- What's most helpful/impactful to partners?

KTPA 000522Z 2209/2312 VRB03KT P6SM SCT050 SCT250 FM221500 19006KT P6SM FEW035 BKN250 FM221800 20008KT P6SM VCTS SCT040CB SCT200 FM222000 26009KT P6SM VCTS SCT035CB SCT250 FM230000 31007KT P6SM VCTS SCT035CB SCT200 FM230200 11006KT P6SM SCT040 BKN200=

What Actually Happened?

The Official Forecast Issued - 12Z

KTPA 161120Z 1612/1718 11005KT P6SM FEW025 BKN250 FM161400 16006KT P6SM SCT035 BKN250 FM161900 23007KT P6SM VCTS SCT030CB BKN050 TEMPO 1620/1624 VRB15G25KT 3SM TSRA BKN020CB FM170000 VRB05KT P6SM VCSH SCT030 BKN080 FM170300 10004KT P6SM FEW030 BKN130 FM171400 16005KT P6SM VCSH SCT030 SCT150 BKN250 FM171600 21007KT P6SM VCTS SCT035CB SCT250=

The Forecaster Discussion

.AVIATION... (12Z TAFS) Issued at 755 AM EDT

VFR conditions are expected outside of any convection that develops this afternoon and evening and have added TEMPO groups beginning at 19-20Z and ending 23-24Z and then kept VCSH in for a few hours this evening. East to southeast winds will increase to 5 to 10 knots this morning, but are expected to shift to onshore at TPA, PIE and SRQ during the afternoon as the sea breeze develops. Light east to southeast winds then return to all sites this evening. Winds in the vicinity of convection could be strong and gusty.



Wintertime Exercise 9PM February Night



COLL'ABORATING CENTERS: WPC, NHC, OPC

7_0140z goes-e/w mosaic us sat image

The Setup - OZ Surface Analysis





The Setup - Latest Convective Outlook



"Further to the south across north-central Florida...This should support a wind damage threat this evening...and should also support isolated tornado threat. The threat should continue into the overnight period as the squall-line moves across north-central Florida."

-SPC Outlook



SLAT 27.70 SLON -82.40 SELV 13.00 SHOW 1.99 LIFT -0.90 LFTV -1.56 SWET 421.1 KINX 10.00 CTOT 20.00 VTOT 21.30 TOTL 41.30 CAPE 550.2 CAPV 688.3 CINS -8.19 CINV -4.86 EQLV 186.9 EQTV 186.8 LFCT 894.0 LFCV 900.4 BRCH 4.73 BRCV 5.92 LCLT 292.1 920.8 LCLP LCLE 343.6 MLTH 299.1 MLMR 15.25 THCK 5750. PWAT 38.44

Current Conditions - SPC Mesoscale Discussion



SUMMARY...A line of storms approaching from the west will pose damaging wind, and perhaps brief tornado threat later tonight.

- SPC Mesoscale Discussion

Current Conditions - Tornado Watch



The NWS Storm Prediction Center has issued a

- * Tornado Watch for portions of
- * Effective from 925 PM until 300 AM EST.
- * Primary threats include...

A couple tornadoes possible

Scattered damaging wind gusts to 65 mph possible

AVIATION...Tornadoes and a few severe thunderstorms with hail surface and aloft to 0.5 inches. Extreme turbulence and surface wind gusts to 55 knots. A few cumulonimbi with maximum tops to 450. Mean storm motion vector 24040.

The Official Forecast Issued - OZ

KTPA 062347Z 0700/0806 19016G25KT P6SM VCSH SCT020 OVC060 WS020/20045KT TEMPO 0701/0703 BKN020 FM070300 19020G33KT P6SM VCTS SCT025CB OVC030 WS020/20050KT TEMPO 0703/0707 2SM TSRA FEW008CB BKN015 FM070900 27013G27KT P6SM VCSH SCT020 BKN030 FM071200 29015G25KT P6SM SCT030 BKN050 OVC250 FM072100 31011G18KT P6SM SCT080 SCT250 FM080000 30006KT P6SM SKC=

The Forecaster Discussion

.AVIATION...

Some MVFR ceilings should be moving into the northern terminals over the next couple of hours, with the line of storms then possible generally after 03z and progressing southward through the night. Winds will remain very strong through the squall line passage, and then diminish a bit for the day Friday, and finally dropping off generally after 21z as skies clear out.

Discussion Time

Work off the OZ TAF

- What do you like?
- What would you change?
- What's most helpful/impactful to partners?

KTPA 062347Z 0700/0806 19016G25KT P6SM VCSH SCT020 OVC060 WS020/20045KT TEMPO 0701/0703 BKN020 FM070300 19020G33KT P6SM VCTS SCT025CB OVC030 WS020/20050KT TEMPO 0703/0707 2SM TSRA FEW008CB BKN015 FM070900 27013G27KT P6SM VCSH SCT020 BKN030 FM071200 29015G25KT P6SM SCT030 BKN050 OVC250 FM072100 31011G18KT P6SM SCT080 SCT250 FM080000 30006KT P6SM SKC=

What Actually Happened?

Airport Weather Warning

National Weather Service Tampa Bay Area Ruskin FL

1027 PM EST

...AIRPORT WEATHER WARNING...

The National Weather Service in Ruskin has issued an Airport Weather Warning for...

Tampa International Airport /TPA/.

Until 1130 PM EST.

The following weather hazards are expected

Wind gusts 50 knots or higher.

A Tornado Watch remains in effect until 300 AM EST for west central Florida.

The 2:45Z Update

KTPA 070243Z 0703/0806 19020G33KT P6SM VCTS SCT025CB OVC030 WS020/20050KT TEMPO 0704/0708 1SM TSRA FEW008CB BKN015 FM070900 27013G27KT P6SM VCSH SCT020 BKN030 FM071200 29015G25KT P6SM SCT030 BKN050 OVC250 FM072100 31011G18KT P6SM SCT080 SCT250 FM080000 30006KT P6SM SKC=

The 3:29Z Update

KTPA 070329Z 0703/0806 19020G33KT P6SM VCTS SCT025CB OVC030 WS020/20050KT TEMPO 0703/0705 21040G50KT 1/2SM +TSRA FEW008CB BKN015 FM070900 27013G27KT P6SM VCSH SCT020 BKN030 FM071200 29015G25KT P6SM SCT030 BKN050 OVC250 FM072100 31011G18KT P6SM SCT080 SCT250 FM080000 30006KT P6SM SKC=



METAR Observation

KTPA 070358Z 29026G36KT 1 1/4SM R01L/2800VP6000FT TSRA BKN025CB BKN075 OVC150 19/16 A2969 RMK AO2 **PK WND 27036/0354** WSHFT 0343 LTG DSNT N RAB56 PRESRR OCNL LTGICCA NE-SW TS NE-SW MOV E P0000 T01940161

Final Thoughts

Where do we go from here?

- How do we improve our messaging of convective impacts?
 - Are our TAFs sufficiently conveying hazards?
 - Is there too much detail?
- How do we better leverage Impact-Based Decision Support Services for aviation partners in high-impact events?
- What tools can/should we continue to develop to modernize the program and provide additional information
- What tools are we missing?

Any last questions/comments?

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