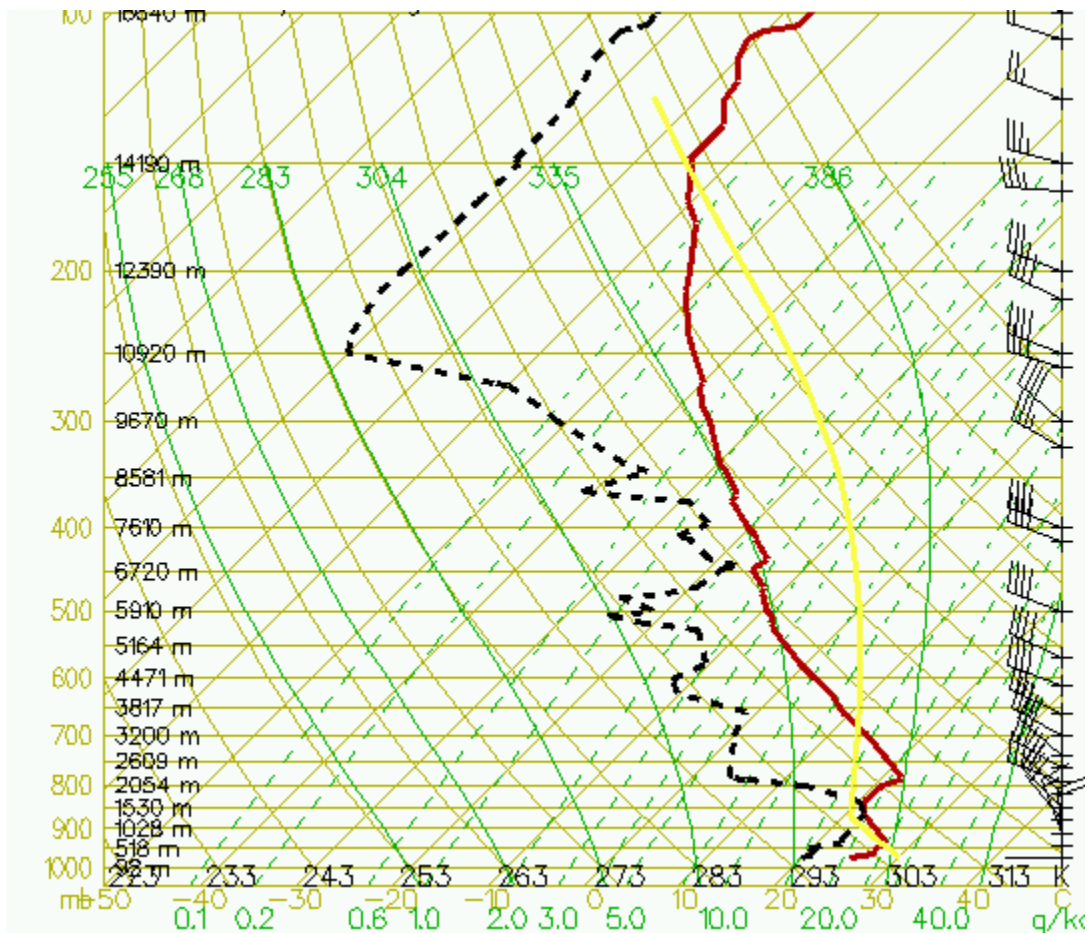


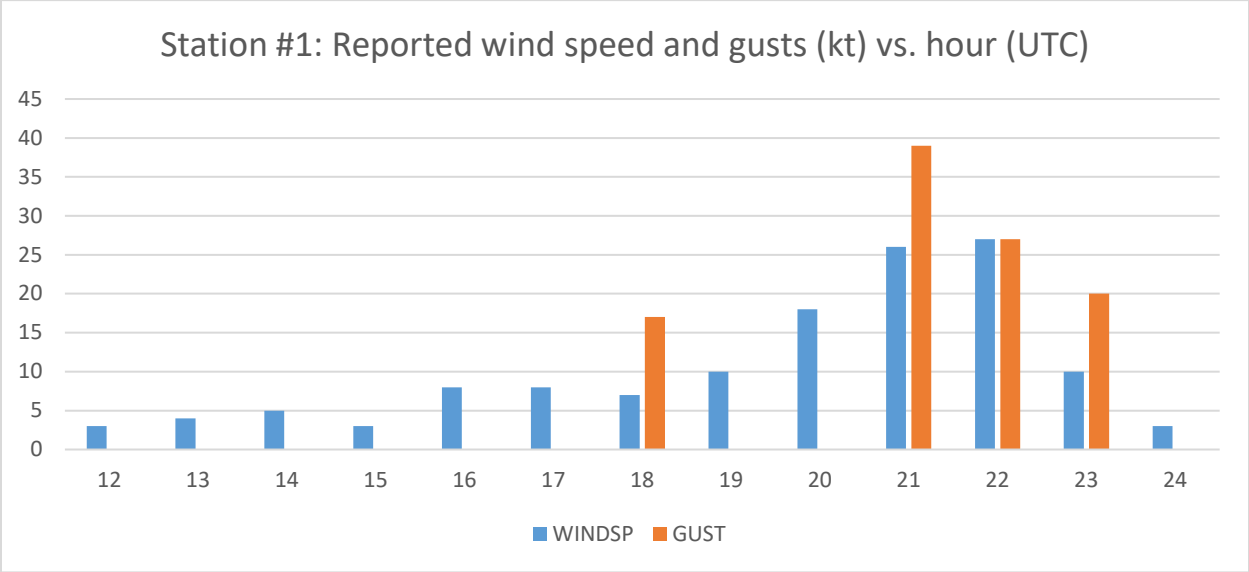
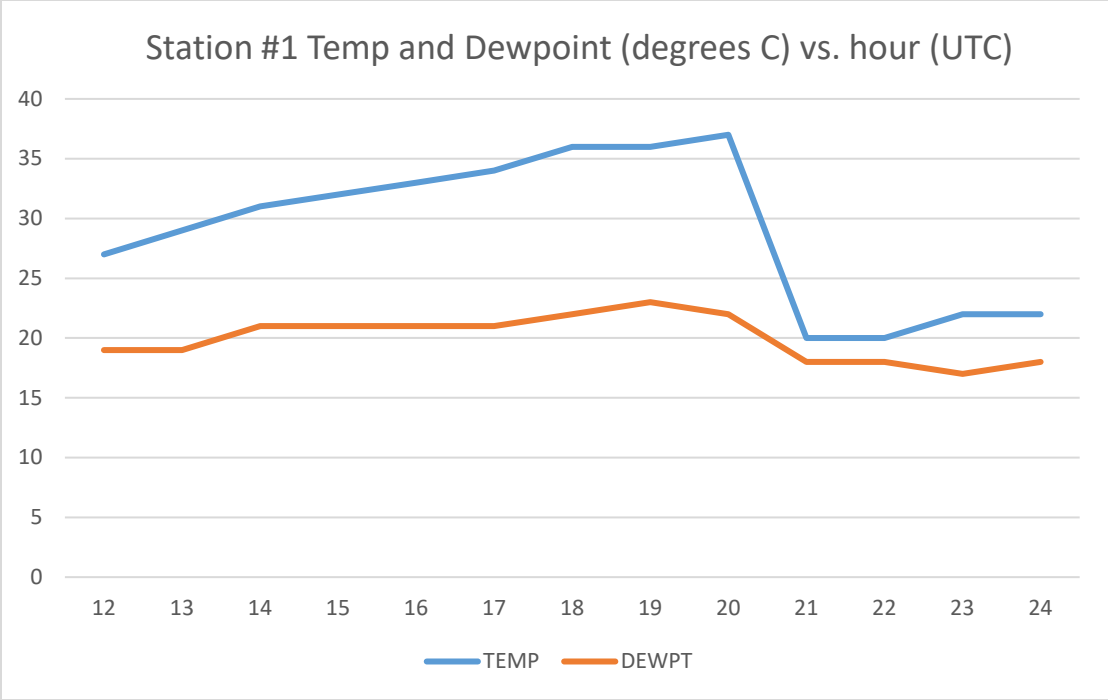
# Weather Analysis and Forecasting: Homework 1, Part 1 KEY

30 points: 10 plotting, 5 METARS, 15 Thermodynamic vars.

## STATION #1

Skew-T plot





**Station #1: Dry Thermodynamic variables**

<u>P (mb)</u>	<u>T (°C)</u>	<u>Θ (K)</u>	<u>ρ<sub>d</sub> (kg m<sup>-3</sup>)</u>
975	25	300.31	1.139431
1000	-9999	-9999	-9999
925	26.4	306.3	1.075946
850	21.2	308.34	1.006174
700	14	317.96	0.84939
500	-9.5	321.39	0.660785
400	-20.1	328.78	0.550772
300	-35.1	335.79	0.439108
250	-43.9	340.66	0.37997
200	-52.9	348.84	0.316397
150	-63.9	359.81	0.249772
100	-67.3	397.43	0.169265

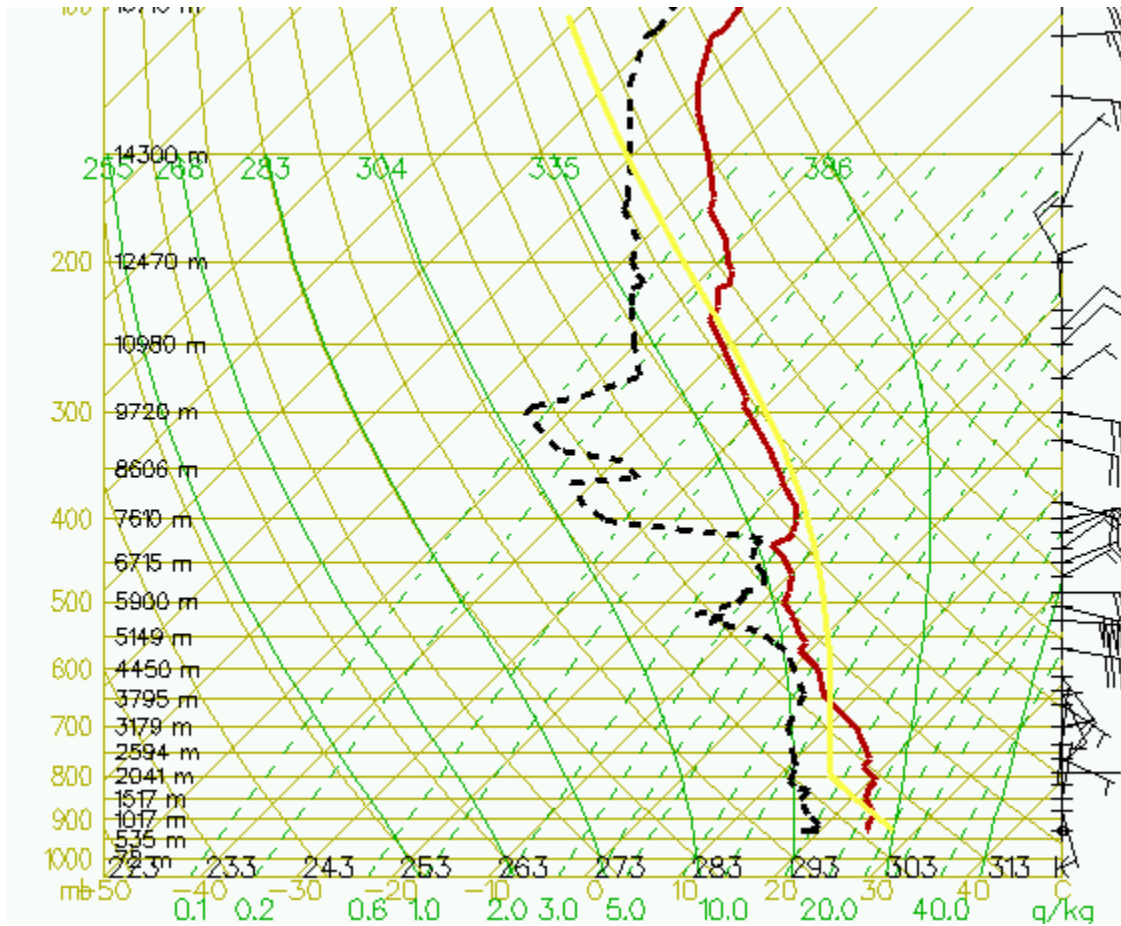
**Station #1: Moist Thermodynamic variables**

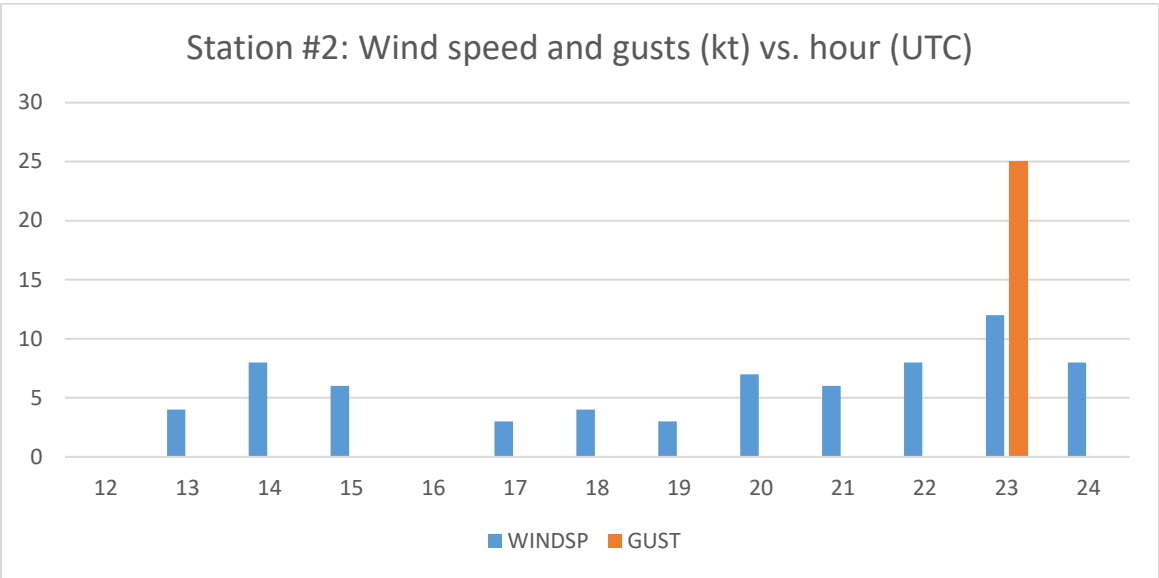
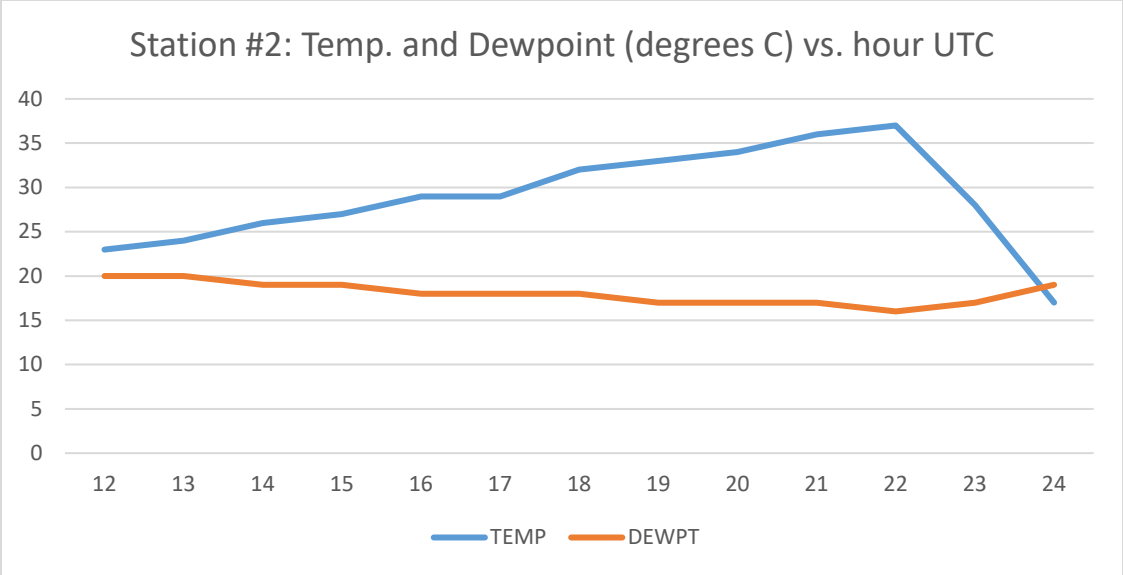
<u>P (mb)</u>	<u>T<sub>d</sub> (°C)</u>	<u>ρ<sub>v</sub> (kg m<sup>-3</sup>)</u>	<u>e (mb)</u>	<u>r<sub>v</sub> (g kg<sup>-1</sup>)</u>	<u>RH</u>	<u>e<sub>s</sub> (mb)</u>
975	20	0.017003	23.36947123	15.34	73.78	31.67429
1000	-9999	-9999	-9999	-9999	-9999	-9999
925	22.2	0.019373	26.75264714	18.6	77.72	34.41965
850	21	0.018319	24.85764137	18.81	98.78	25.16505
700	0	0.004617	6.112	5.5	38.26	15.97385
500	-21.5	0.000908	1.104033474	1.38	37.01	2.982859
400	-25.1	0.000688	0.802116482	1.25	64.34	1.246611
300	-51.1	5.1E-05	0.055979725	0.12	17.96	0.311662
250	-79.9	1.03E-06	0.001092232	0	0.87	0.12542
200	-82.9	6.58E-07	0.000668275	0	1.47	0.045322
150	-81.9	8.18E-07	0.000788779	0	6.94	0.011372
100	-83.3	6.59E-07	0.000625034	0	8.73	0.007163

<u>P (mb)</u>	<u>T<sub>v</sub> (K)</u>	<u>T<sub>w</sub> (°C)</u>	<u>Θ<sub>w</sub> (°C)</u>	<u>T<sub>e</sub> (K)</u>	<u>Θ<sub>e</sub> (K)</u>	<u>Θ<sub>v</sub> (K)</u>
975	300.8834	21.51	22.36	342.9875	345.48	303.07
1000	-9999	-9999	-9999	-9999	-9999	-9999
925	302.871	23.33	25.91	354.5166	362.51	309.7
850	297.6391	21.1	26.5	349.0434	365.65	311.8
700	288.0729	6.35	20.02	303.2888	335.86	319.01
500	263.8168	-13.07	17.39	267.6142	326.29	321.66
400	253.1772	-21.35	19.36	256.509	333.36	329.03
300	237.9854	-36.28	20.13	238.3185	336.28	335.81
250	229.1564	-44.64	21.22	229.1699	340.68	340.66
200	220.1511	-53.25	23.11	220.1574	348.85	348.84
150	209.1391	-64.01	25.39	209.145	359.82	359.81
100	205.7177	-67.41	31.54	205.728	397.46	397.44

# STATION #2

Skew-T plot





**Station #2: Dry Thermodynamic variables**

<u>P (mb)</u>	<u>T (°C)</u>	<u>Θ (K)</u>	<u>ρ<sub>d</sub> (kg m<sup>-3</sup>)</u>
928	25	304.58	1.084504
1000	-9999	-9999	-9999
925	24.8	304.66	1.081724
850	21.4	308.55	1.005491
700	12.6	316.41	0.853552
500	-7.7	323.59	0.656304
400	-15.1	335.27	0.5401
300	-31.3	341.15	0.432208
250	-41.1	344.82	0.375385
200	-49.1	354.85	0.311031
150	-62.3	362.56	0.247877
100	-74.3	383.92	0.175224

**Station #2: Moist Thermodynamic variables**

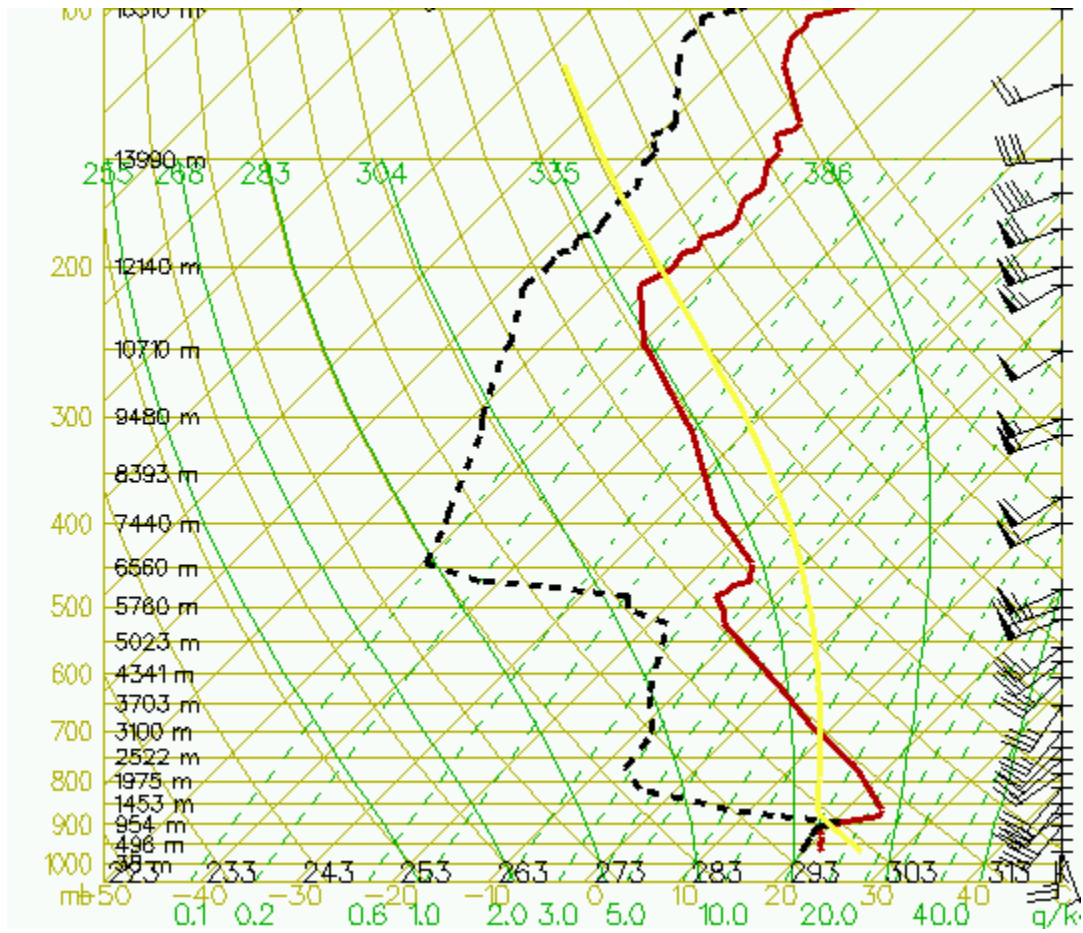
<u>P (mb)</u>	<u>T<sub>d</sub> (°C)</u>	<u>ρ<sub>v</sub> (kg m<sup>-3</sup>)</u>	<u>e (mb)</u>	<u>r<sub>v</sub> (g kg<sup>-1</sup>)</u>	<u>RH</u>	<u>e<sub>s</sub> (mb)</u>
928	20	0.017003	23.36947	16.14	73.78	31.67429
1000	-9999	-9999	-9999	-9999	-9999	-9999
925	18.8	0.015789	21.68732	15	69.29	31.29818
850	14.4	0.012073	16.39324	12.28	64.35	25.47579
700	5.6	0.006903	9.092884	8.21	62.37	14.5794
500	-12.5	0.00192	2.349224	2.94	68.44	3.432346
400	-35.1	0.000262	0.311662	0.49	16.4	1.900379
300	-54.3	3.44E-05	0.03835	0.08	8.5	0.451079
250	-50.1	5.87E-05	0.062842	0.16	37.19	0.168997
200	-59.1	2.05E-05	0.021217	0.07	30.11	0.070461
150	-70.3	4.83E-06	0.004692	0.02	33.39	0.014051
100	-81.3	9.5E-07	0.00087	0.01	33.37	0.002608

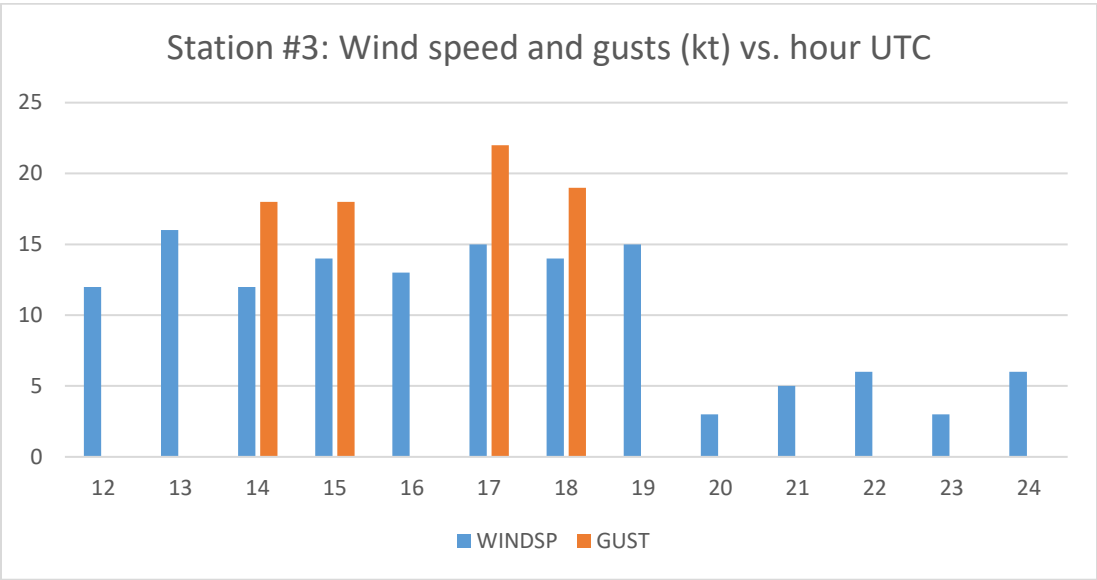
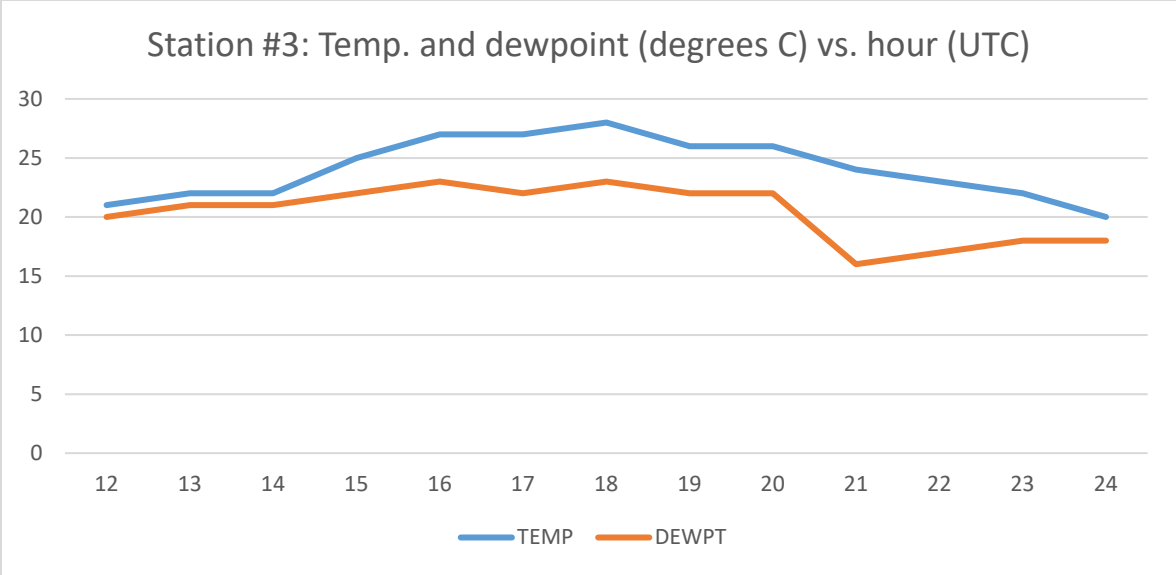
<u>P (mb)</u>	<u>T<sub>v</sub> (K)</u>	<u>T<sub>w</sub> (°C)</u>	<u>Θ<sub>w</sub> (°C)</u>	<u>T<sub>e</sub> (K)</u>	<u>Θ<sub>e</sub> (K)</u>	<u>Θ<sub>v</sub> (K)</u>
928	301.0177	21.45	24	345.4969	352.96	307.52
1000	-9999	-9999	-9999	-9999	-9999	-9999
925	300.6218	20.6	23.29	341.9303	349.64	307.4
850	296.7036	16.71	22.49	330.3526	346.07	310.82
700	287.1337	8.39	21.68	309.348	342.57	317.97
500	265.8673	-9.6	19.45	273.6671	333.67	324.16
400	258.0556	-19.18	20.36	259.4638	337.2	335.37
300	241.7769	-33.11	21.42	242.0178	341.5	341.16
250	231.9817	-41.71	22.36	232.4189	345.51	344.86
200	223.9566	-49.47	24.46	224.1396	355.16	354.87
150	210.7376	-62.4	25.94	210.7957	362.66	362.56
100	198.7196	-74.33	29.58	198.7351	383.95	383.92



# STATION #3

Skew-T plot





### Station #3: Dry Thermodynamic variables

<u>P (mb)</u>	<u>T (°C)</u>	<u>Θ (K)</u>	<u>ρ<sub>d</sub> (kg m<sup>-3</sup>)</u>
966	21.6	297.68	1.141935
1000	-9999	-9999	-9999
925	20	299.75	1.099436
850	22.6	309.81	1.001411
700	8.6	311.98	0.86567
500	-14.1	315.79	0.672519
400	-22.7	325.4	0.55649
300	-37.9	331.84	0.444334
250	-48.7	333.53	0.388095
200	-54.7	345.99	0.319004
150	-55.5	374.25	0.240132
100	-63.5	404.77	0.166197

### Station #3: Moist Thermodynamic variables

<u>P (mb)</u>	<u>T<sub>d</sub> (°C)</u>	<u>ρ<sub>v</sub> (kg m<sup>-3</sup>)</u>	<u>e (mb)</u>	<u>r<sub>v</sub> (g kg<sup>-1</sup>)</u>	<u>RH</u>	<u>e<sub>s</sub> (mb)</u>
966	19.7	0.016882	22.93854	15.19	88.94	25.78989
1000	-9999	-9999	-9999	-9999	9999	-9999
925	19	0.01625	21.96006	15.19	93.97	23.36947
850	4.6	0.006221	8.48137	6.29	30.94	27.41186
700	-8.4	0.002503	3.250843	2.91	29.11	11.16784
500	-24.1	0.000735	0.877474	1.1	42.53	2.063024
400	-51.7	4.52E-05	0.052197	0.08	5.25	0.993657
300	-58.9	2.01E-05	0.02176	0.05	9.25	0.235273
250	-63.7	1.13E-05	0.01168	0.03	15.84	0.073737
200	-67.7	6.73E-06	0.006776	0.02	18.54	0.036546
150	-68.5	6.04E-06	0.006059	0.03	18.27	0.033168
100	-74.5	2.62E-06	0.002531	0.02	21.1	0.011994

<u>P (mb)</u>	<u>T<sub>v</sub> (K)</u>	<u>T<sub>w</sub> (°C)</u>	<u>Θ<sub>w</sub> (°C)</u>	<u>T<sub>e</sub> (K)</u>	<u>Θ<sub>e</sub> (K)</u>	<u>Θ<sub>v</sub> (K)</u>
966	297.4328	20.31	21.52	338.5243	341.89	300.39
1000	-9999	-9999	-9999	-9999	-9999	-9999
925	295.8102	19.34	22.09	336.7472	344.34	302.48
850	296.8563	12.22	18.32	314.5925	329.56	310.98
700	282.2213	1.13	15.96	290.3575	321.54	312.53
500	259.1746	-16.61	15.36	262.1601	319.64	316
400	250.3995	-25.54	17.23	250.6457	325.74	325.42
300	235.179	-38.92	19.01	235.3136	332.04	331.85
250	224.3669	-49.08	19.44	224.4476	333.66	333.54
200	218.3525	-54.93	22.49	218.4156	346.09	345.99
150	217.5382	-55.78	28.03	217.6079	374.38	374.26
100	209.5117	-63.65	32.52	209.5583	404.86	404.77