

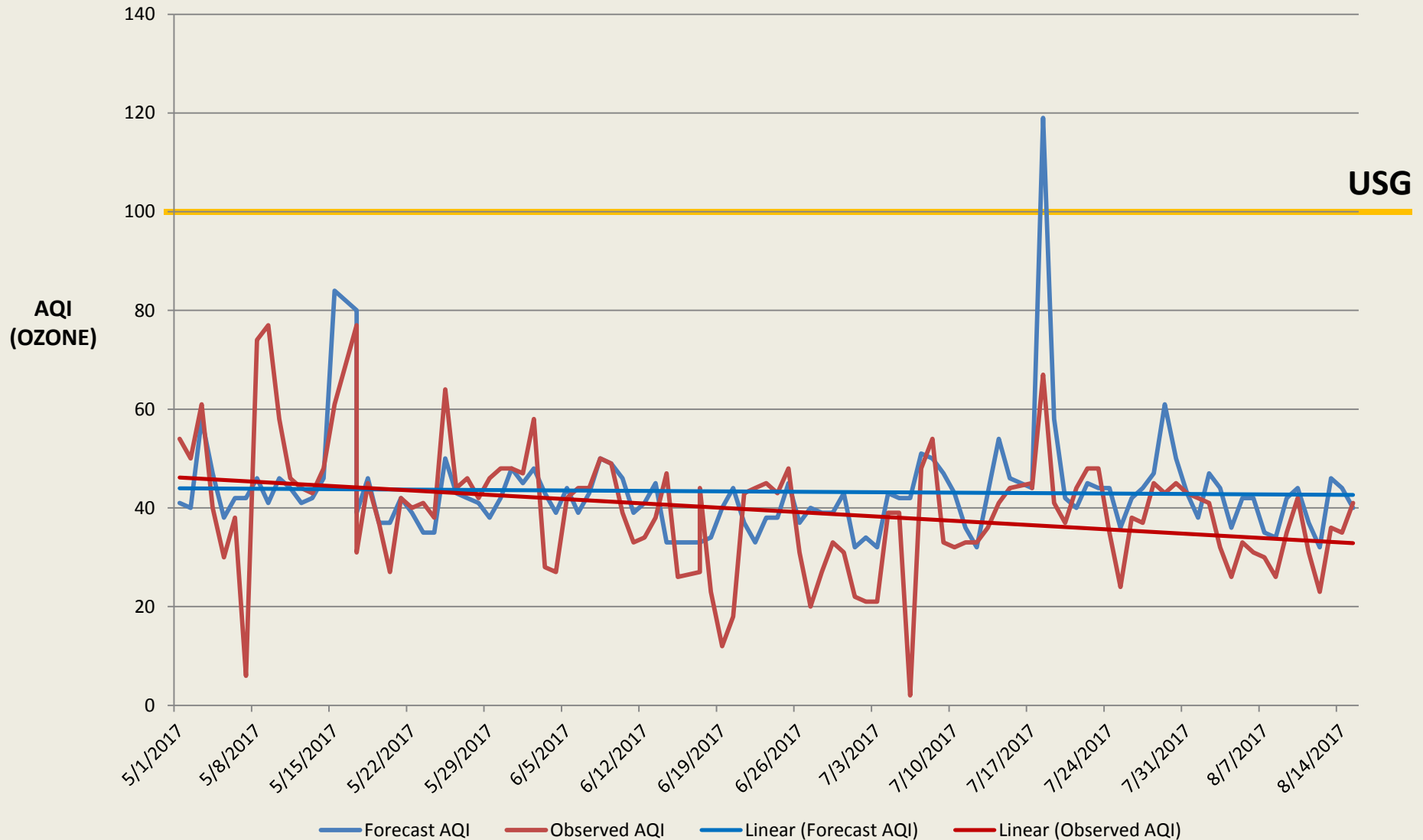
2017 NOAA Model Performance in Alabama

Michael Leach
Geoff Healan

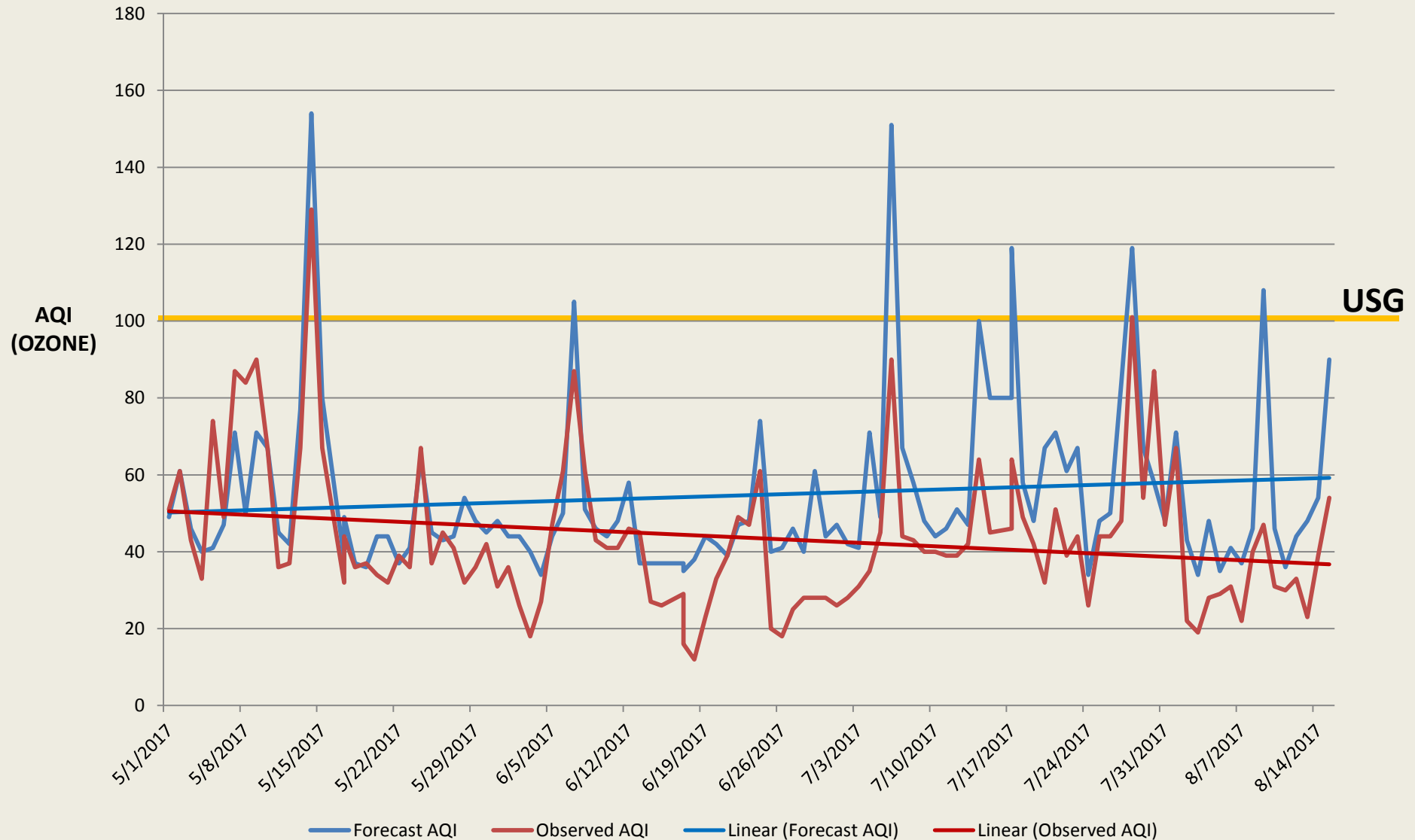


Alabama Department of Environmental Management

Huntsville Forecast vs. Observed

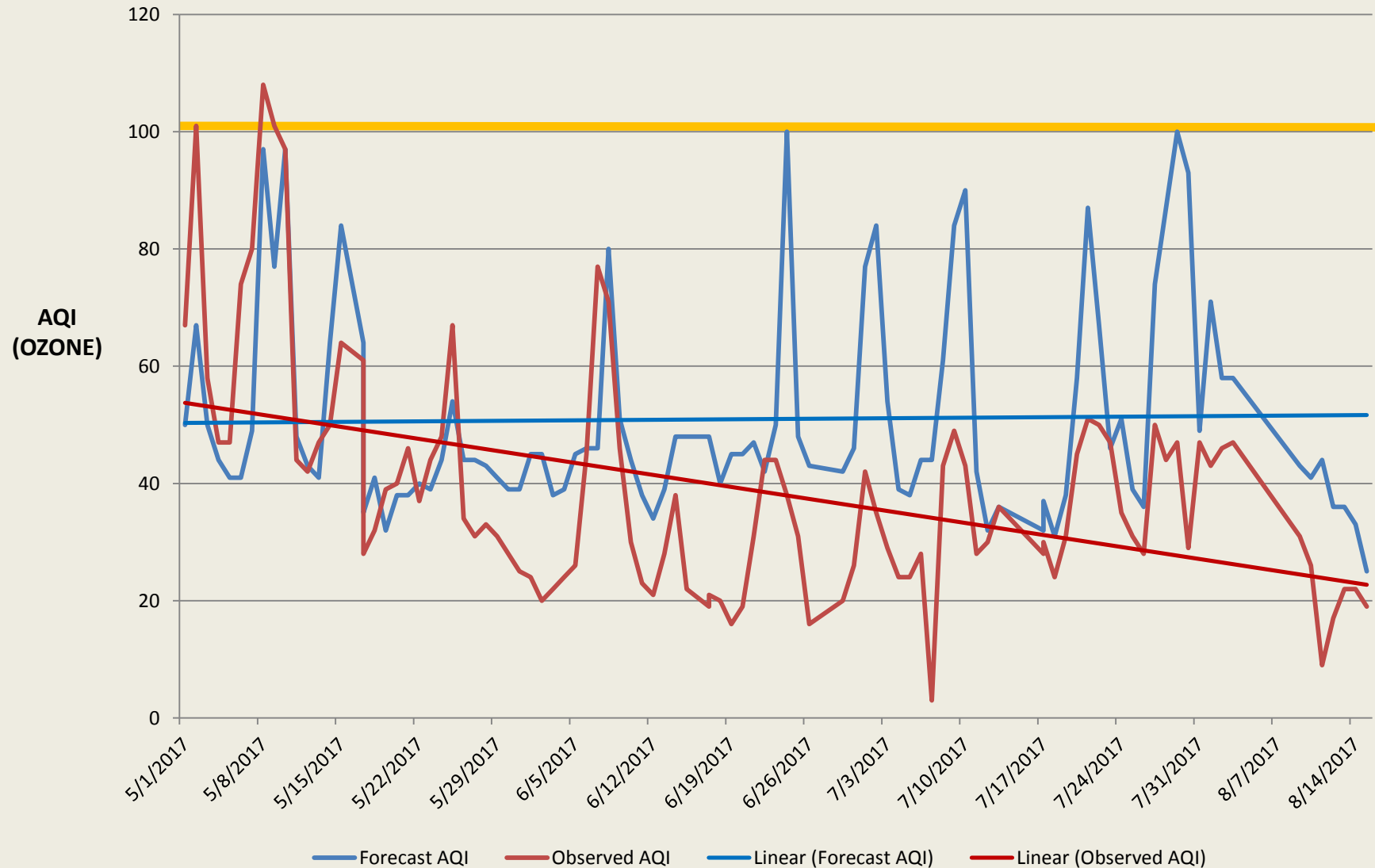


Birmingham Forecast vs. Observed



Mobile Forecast vs. Observed

USG



Model Statistics

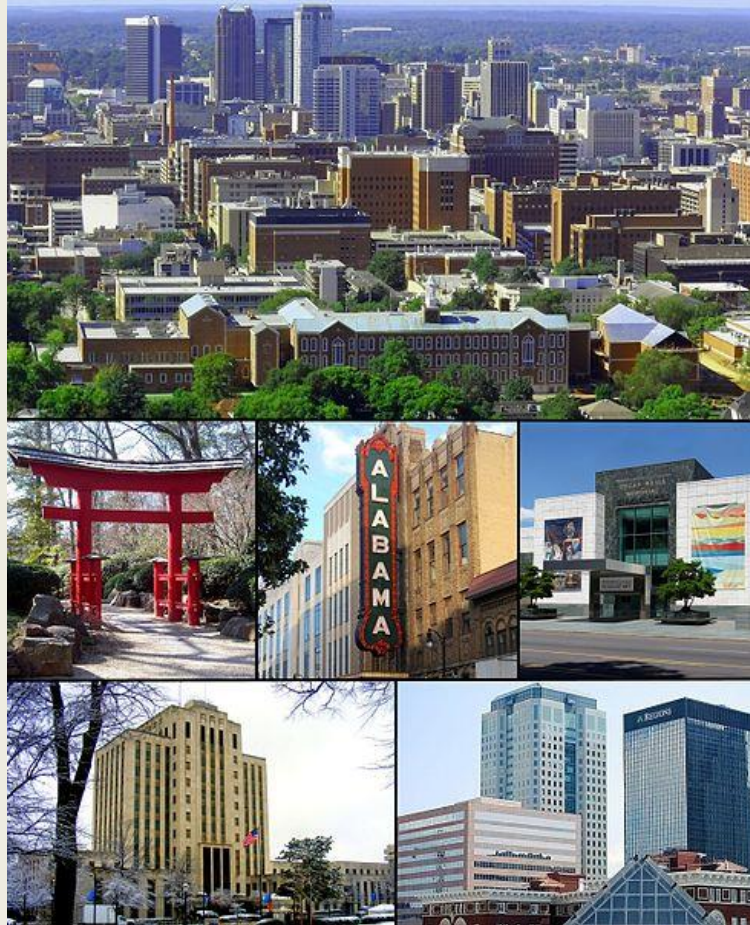
Forecast City	NOAA Model Percent Correct (Color Code)	NOAA Model Bias (AQI)	NOAA FAR
Huntsville (O ₃)	89%	0.82	50%
Huntsville (PM)	85%		0%
Birmingham (O ₃)	80%	1.48	50%
Mobile (O ₃)	75%	2.21	75%

Model Statistics 2016 vs. 2017

Forecast City	NOAA Model Percent Correct (Color Code)	NOAA Model Bias (AQI)	NOAA FAR
Huntsville (2016)	76%	1.08	0%
Huntsville (2017)	89%	0.82	50%
Birmingham (2016)	66%	1.81	43%
Birmingham (2017)	80%	1.48	50%
Mobile (2016)	74%	1.89	100%
Mobile (2017)	75%	2.21	75%

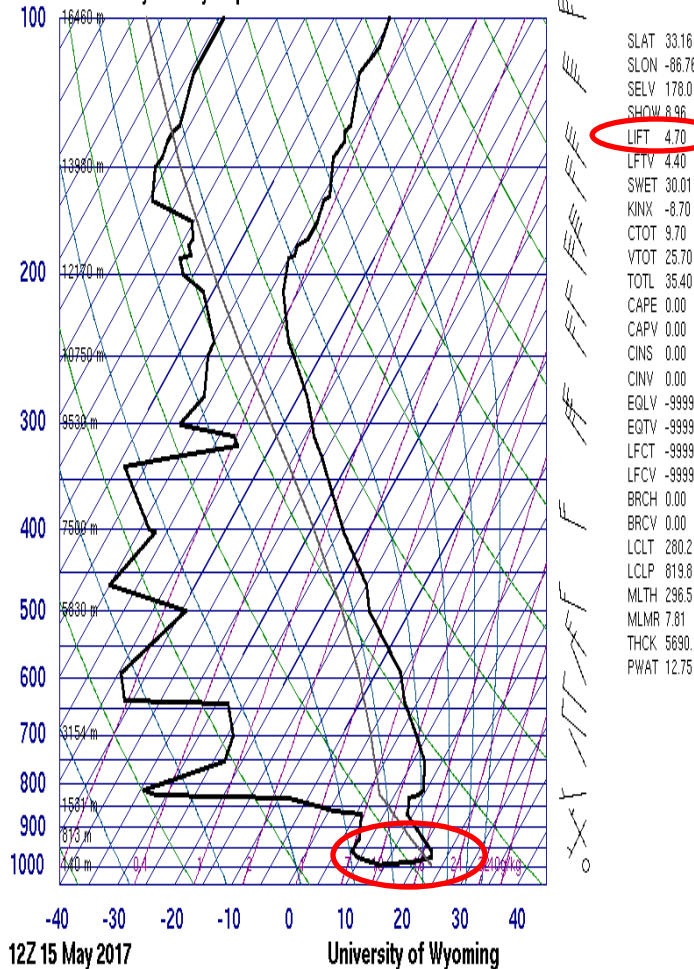
Case Study May 15, 2017

Birmingham, Alabama

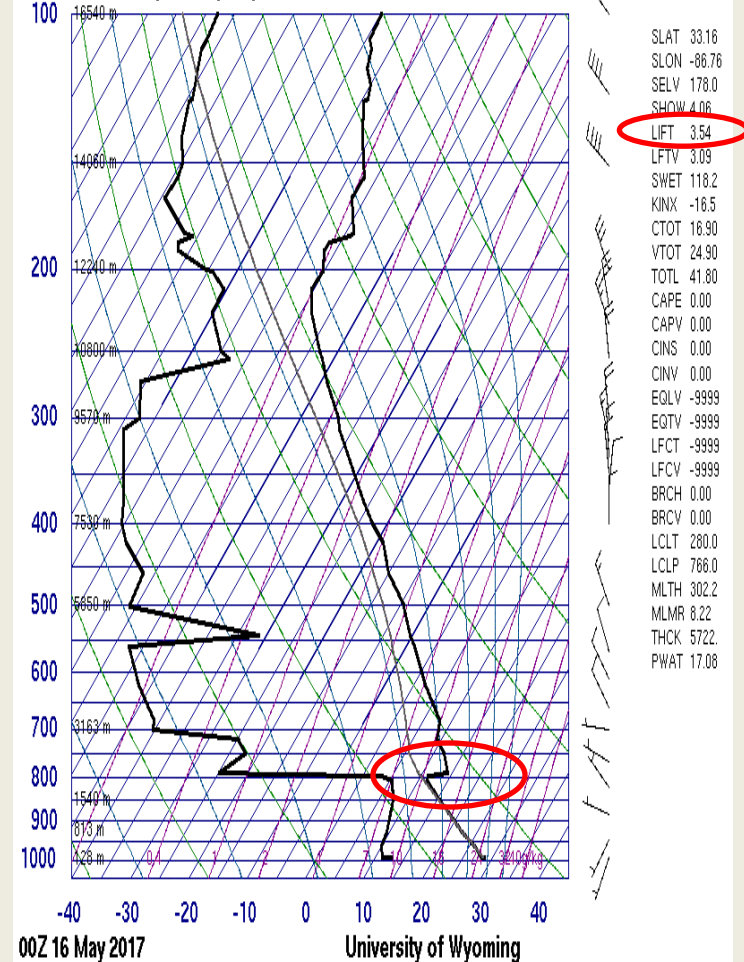


NOAA Forecast AQI for May 15 was **140 AQI**

72230 BMX Shelby County Airport



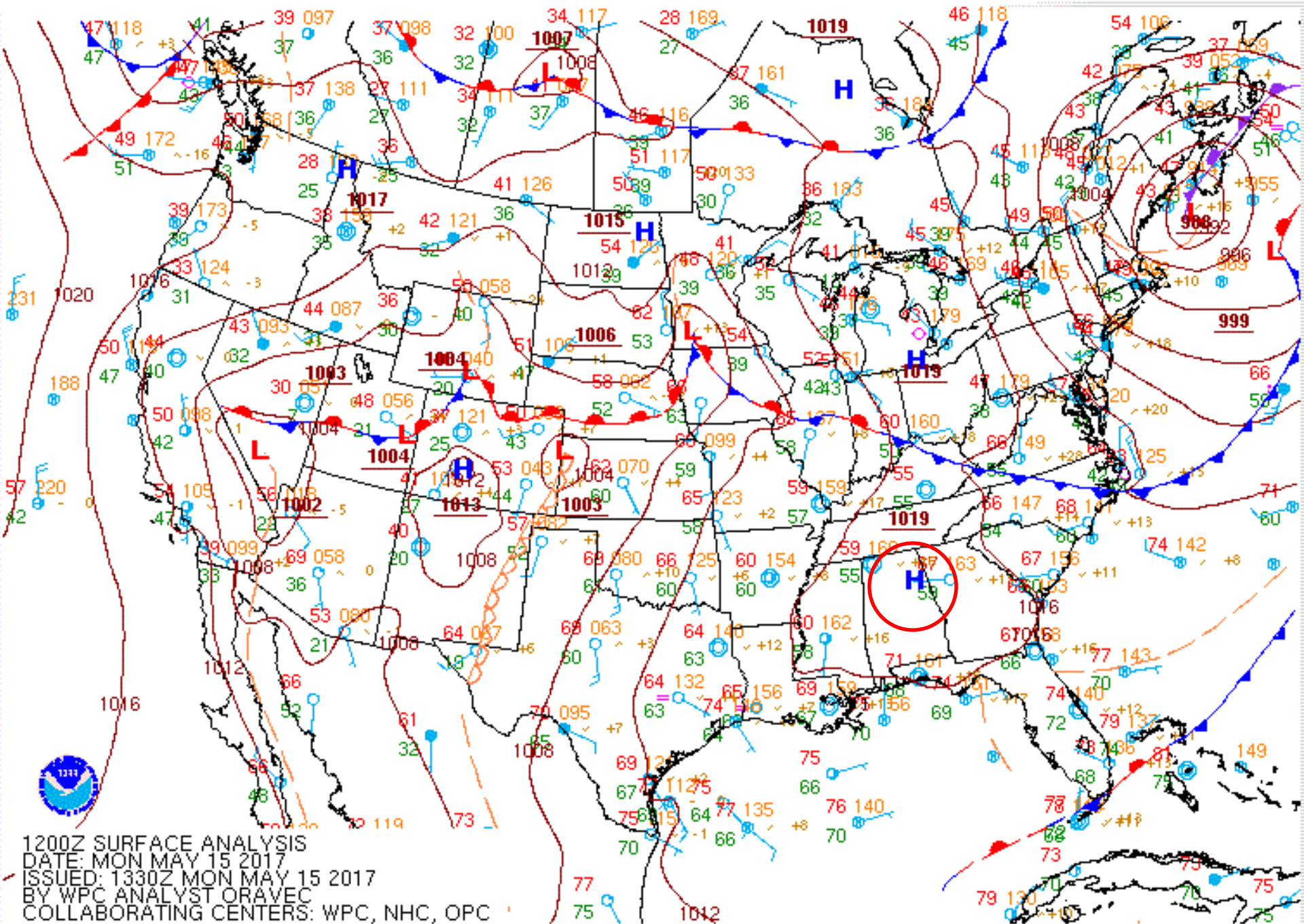
72230 BMX Shelby County Airport

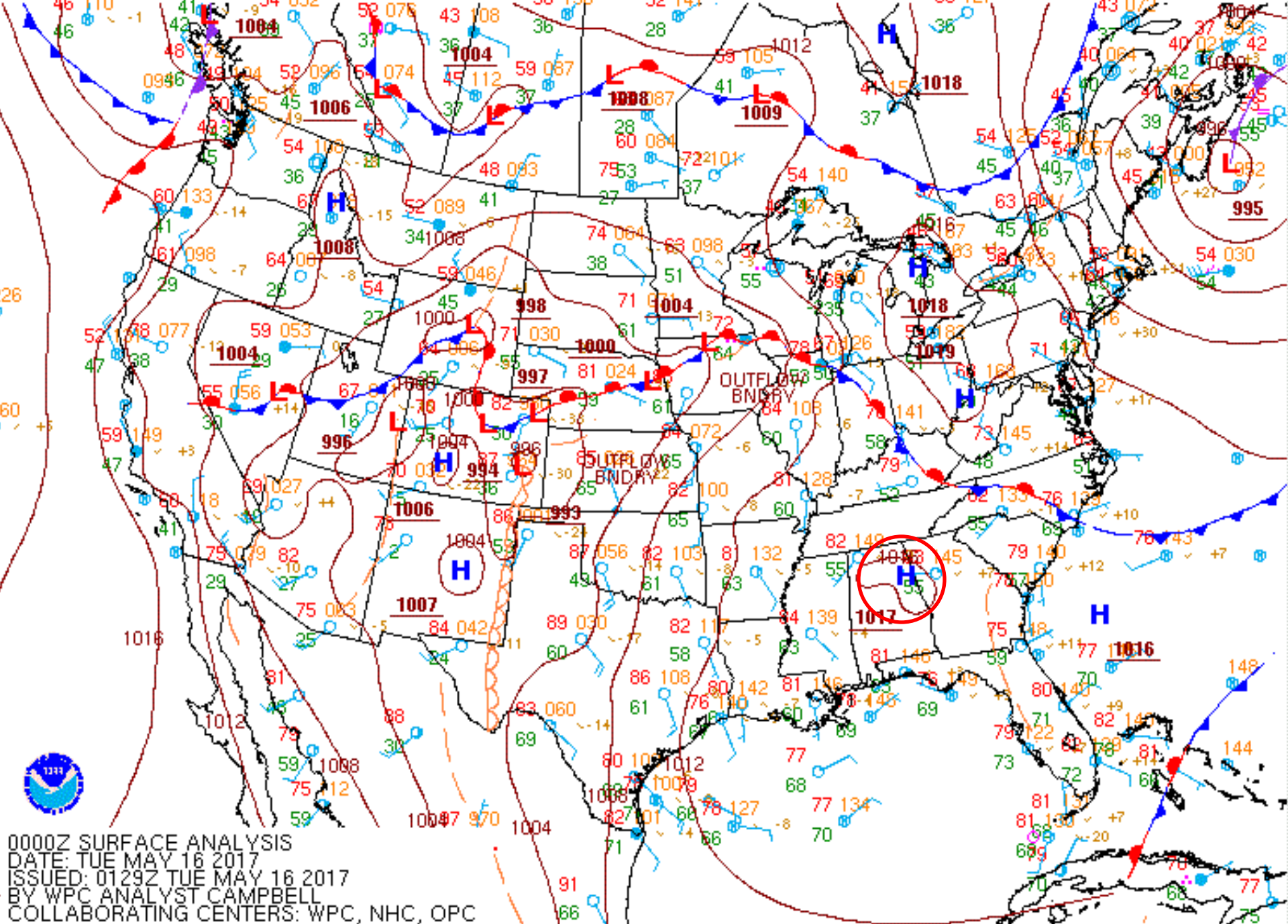


OBSERVED AQI WAS **129**

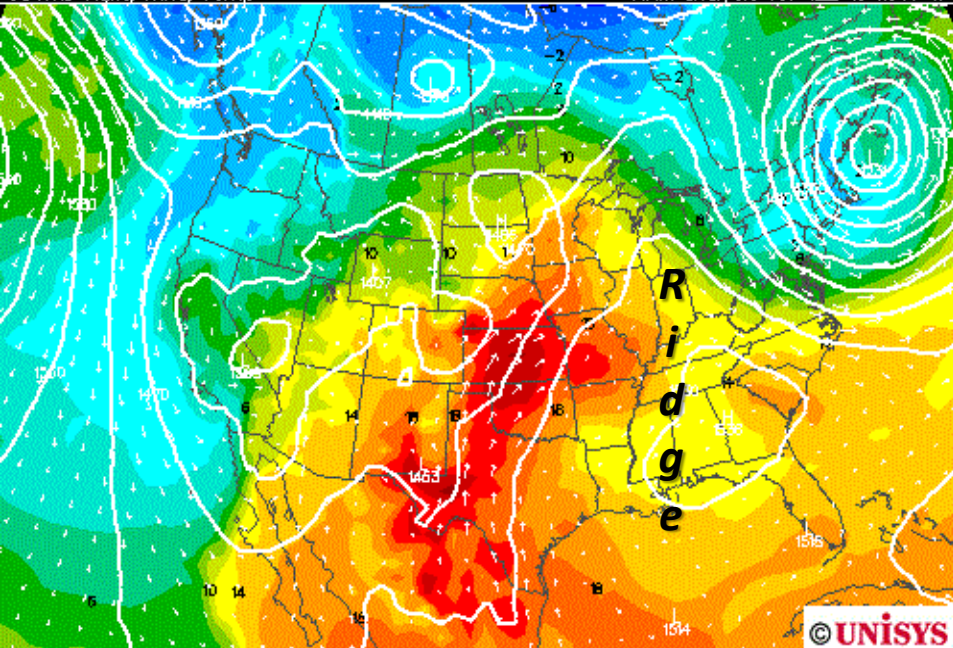
Hourly Weather History & Observations (BMX)

Time (CDT)	Temp.	Heat Index	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:53 AM	64.0 °F	-	60.1 °F	87%	29.99 in	10.0 mi	Calm	Calm	-	N/A		Clear
1:53 AM	63.0 °F	-	59.0 °F	87%	29.99 in	10.0 mi	Calm	Calm	-	N/A		Clear
2:53 AM	63.0 °F	-	57.9 °F	84%	30.00 in	10.0 mi	Calm	Calm	-	N/A		Clear
3:53 AM	61.0 °F	-	57.9 °F	90%	29.99 in	10.0 mi	Calm	Calm	-	N/A		Clear
4:53 AM	60.1 °F	-	57.0 °F	90%	30.01 in	10.0 mi	Calm	Calm	-	N/A		Clear
5:53 AM	60.1 °F	-	55.9 °F	86%	30.02 in	10.0 mi	Calm	Calm	-	N/A		Clear
6:53 AM	63.0 °F	-	57.0 °F	81%	30.04 in	10.0 mi	Calm	Calm	-	N/A		Clear
7:53 AM	69.1 °F	-	55.9 °F	63%	30.05 in	10.0 mi	Calm	Calm	-	N/A		Clear
8:53 AM	75.0 °F	-	59.0 °F	57%	30.06 in	10.0 mi	Calm	Calm	-	N/A		Clear
9:53 AM	78.1 °F	-	57.9 °F	50%	30.06 in	10.0 mi	Calm	Calm	-	N/A		Clear
10:53 AM	81.0 °F	80.7 °F	55.0 °F	41%	30.04 in	10.0 mi	WSW	4.6 mph	-	N/A		Partly Cloudy
11:53 AM	82.0 °F	81.3 °F	54.0 °F	38%	30.04 in	10.0 mi	Calm	Calm	-	N/A		Partly Cloudy
12:53 PM	84.0 °F	82.6 °F	54.0 °F	35%	30.02 in	10.0 mi	Variable	5.8 mph	-	N/A		Partly Cloudy
1:53 PM	87.1 °F	-	52.0 °F	30%	30.00 in	10.0 mi	Variable	5.8 mph	-	N/A		Partly Cloudy
2:53 PM	87.1 °F	-	52.0 °F	30%	29.99 in	10.0 mi	Calm	Calm	-	N/A		Clear
3:53 PM	87.1 °F	85.3 °F	55.0 °F	33%	29.97 in	10.0 mi	NW	4.6 mph	-	N/A		Clear
4:53 PM	87.1 °F	85.7 °F	55.9 °F	35%	29.98 in	10.0 mi	NNW	12.7 mph	-	N/A		Clear
5:53 PM	86.0 °F	84.5 °F	55.0 °F	35%	29.98 in	10.0 mi	NW	9.2 mph	-	N/A		Clear
6:53 PM	84.0 °F	82.9 °F	55.0 °F	37%	29.99 in	10.0 mi	WNW	5.8 mph	-	N/A		Clear
7:53 PM	78.1 °F	-	57.0 °F	48%	29.99 in	10.0 mi	NNE	4.6 mph	-	N/A		Clear
8:53 PM	73.0 °F	-	59.0 °F	61%	30.00 in	10.0 mi	Calm	Calm	-	N/A		Clear
9:53 PM	71.1 °F	-	60.1 °F	68%	30.01 in	10.0 mi	Calm	Calm	-	N/A		Clear
10:53 PM	69.1 °F	-	60.1 °F	73%	30.02 in	10.0 mi	Calm	Calm	-	N/A		Clear
11:53 PM	66.9 °F	-	59.0 °F	76%	30.02 in	10.0 mi	Calm	Calm	-	N/A		Clear

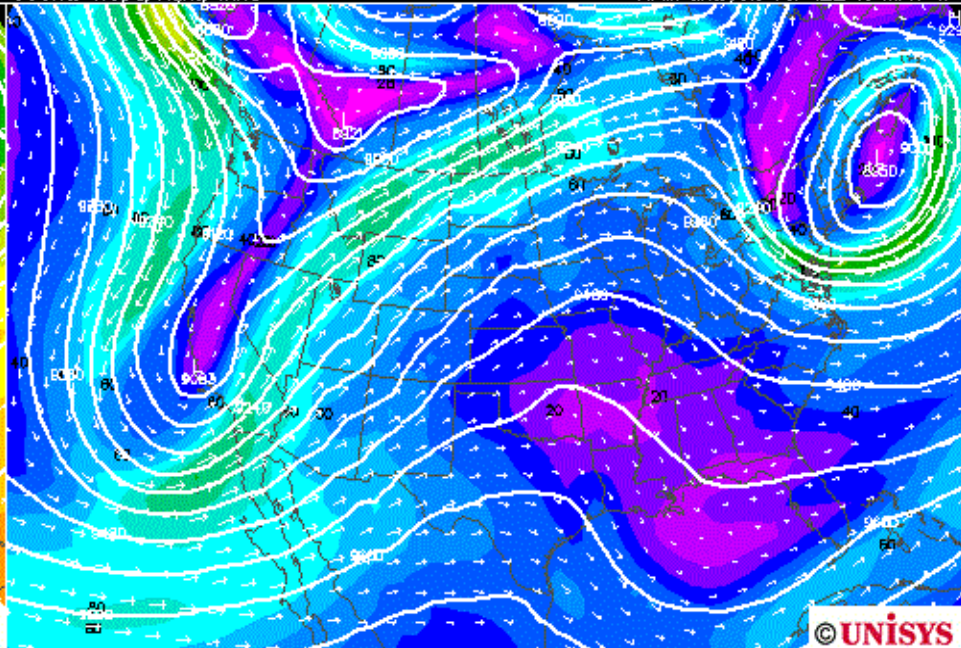




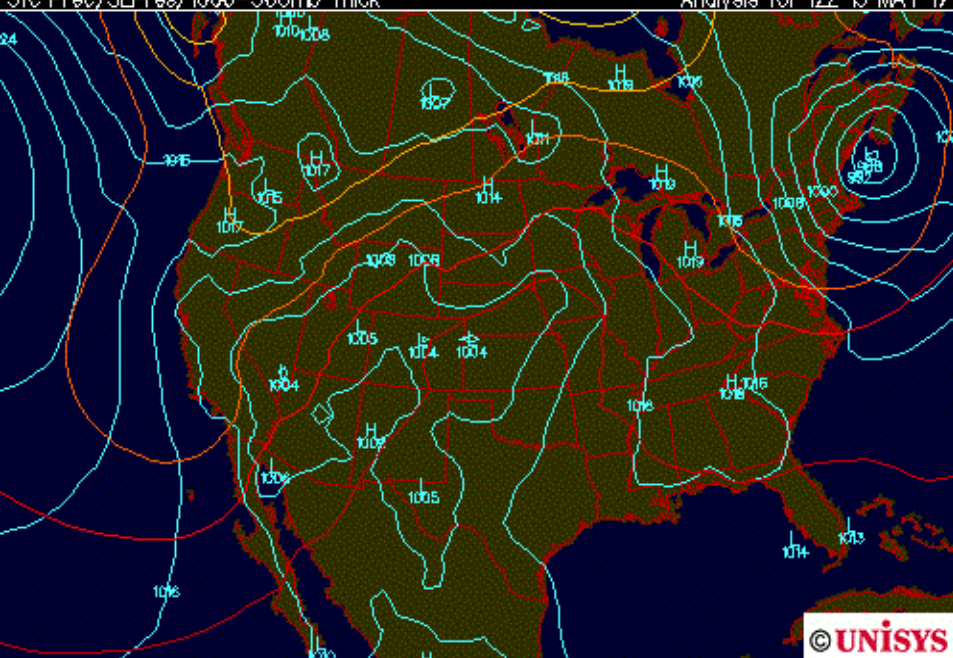
850mb Hght/Wind/Temp



NAM analysis for 12Z 15 MAY 17

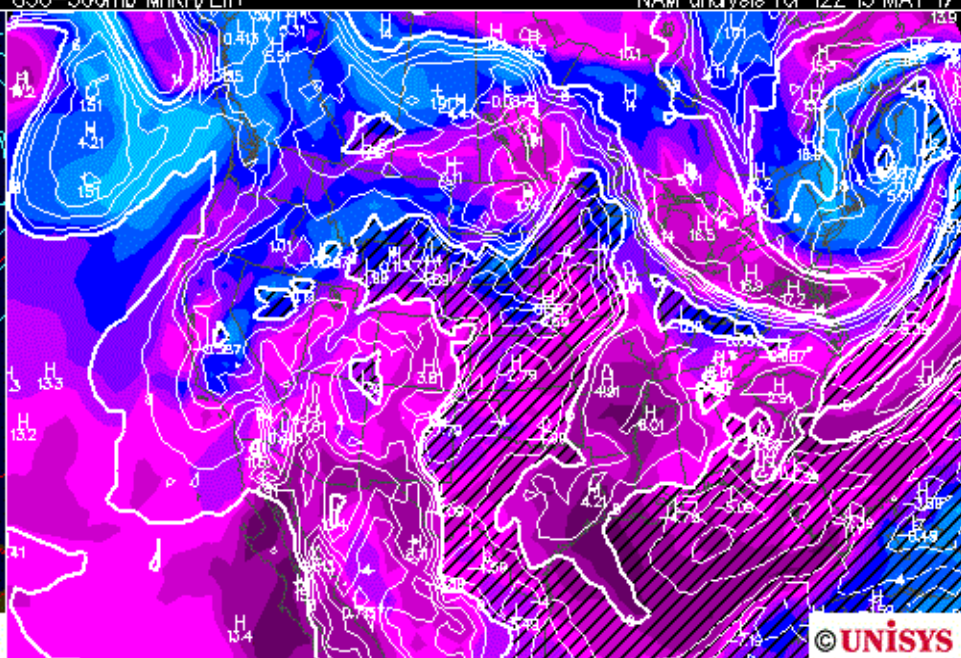


Sfc Prec/SLPres/1000-500mb Thick



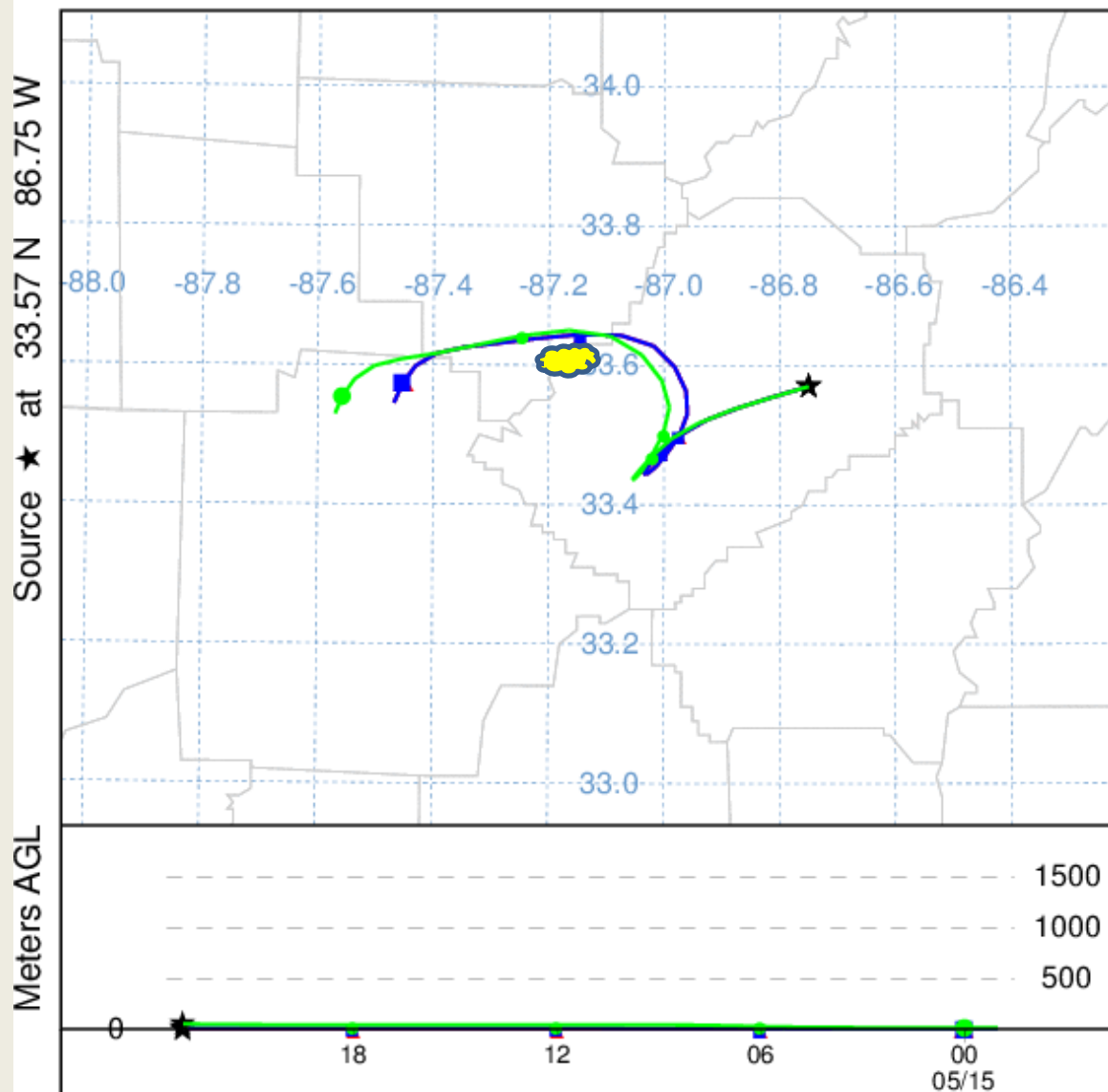
Analysis for 12Z 15 MAY 17

850-500mb MnRH/Lift



NAM analysis for 12Z 15 MAY 17

NOAA HYSPLIT MODEL
Backward trajectories ending at 2300 UTC 15 May 17
GDAS Meteorological Data



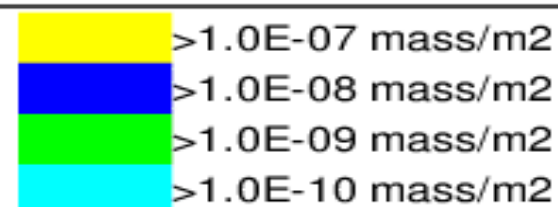
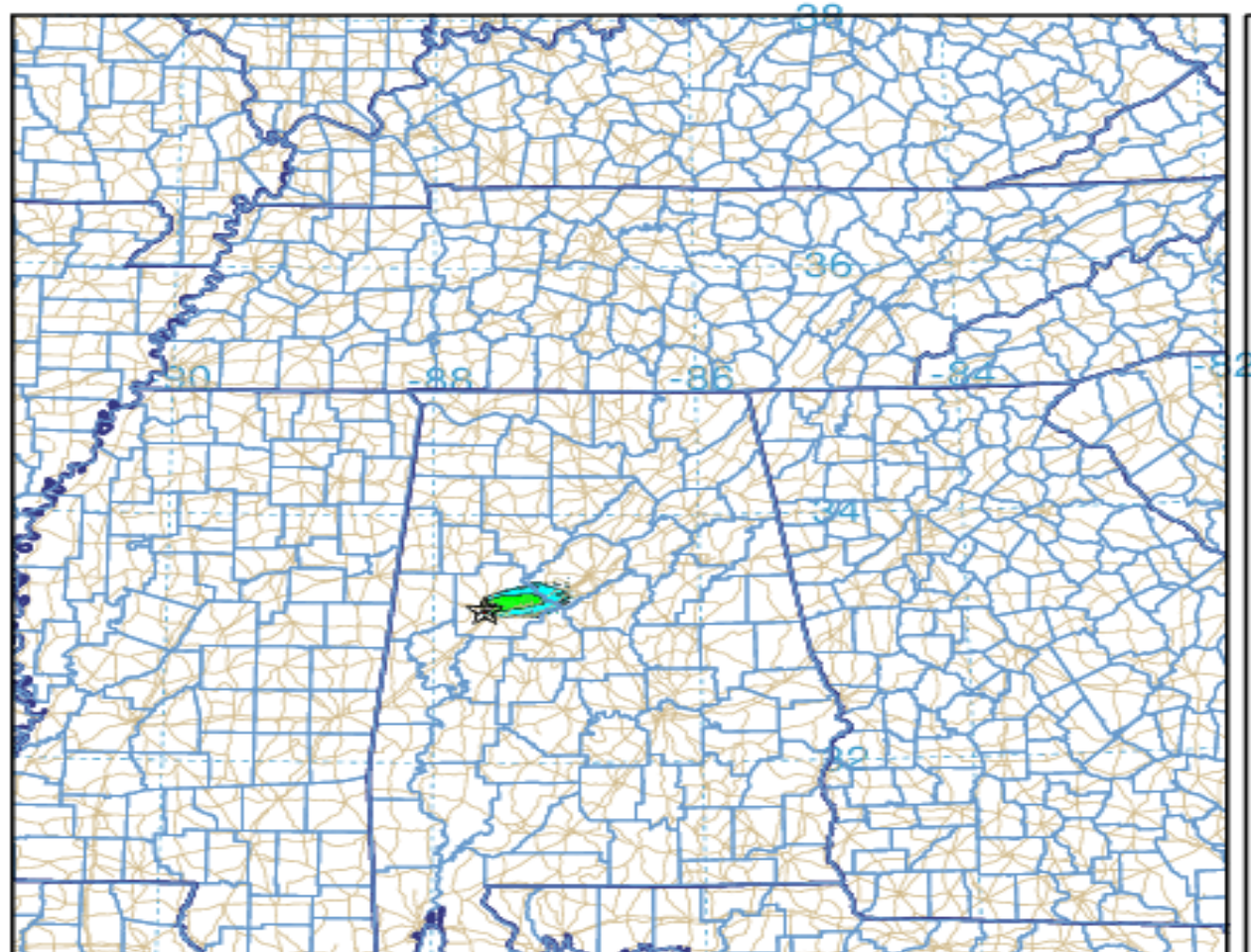
Job ID: 113035 Job Start: Fri Jul 14 13:57:35 UTC 2017
Source 1 lat.: 33.57 lon.: -86.75 hghts: 0, 10, 50 m AGL

Trajectory Direction: Backward Duration: 24 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 15 May 2017 - GDAS1

NOAA HYSPLIT MODEL

Deposition (mass/m²) at ground-level
Integrated from 0000 15 May to 0800 15 May 17 (UTC)
Mass Release started at 0000 15 May 17 (UTC)

Source ☆ 33.220 N 87.620 W
0 mto 50 m



Maximum: 3.2E-07 mass/m²

Minimum: 7.8E-15 mass/m²

GDAS METEOROLOGICAL DATA

Job ID: 27528 Job Start: Fri Jul 14 14:28:09 UTC 2017
Release: lat.: 33.22 lon.: -87.62 Hgt: 0 to 50 m
Pollutant: Mass - Unspecified
Release Quantity: 71 mass Start: 17 05 15 00 0 Duration: 0 hrs, 10 min
Pollutant Averaging/Integration Period: 8 hrs and 0 min
Dry Deposition rate: 0.1 cm/s Wet removal: None #Part: 10000
Meteorology: 0000Z 15 May 2017 - GDAS1
This is not a NOAA product. It was produced by: unknown

Daily Ozone AQI

Monday, May 15, 2017

Birmingham

Atlanta

Savannah

Tallahassee

Jacksonville

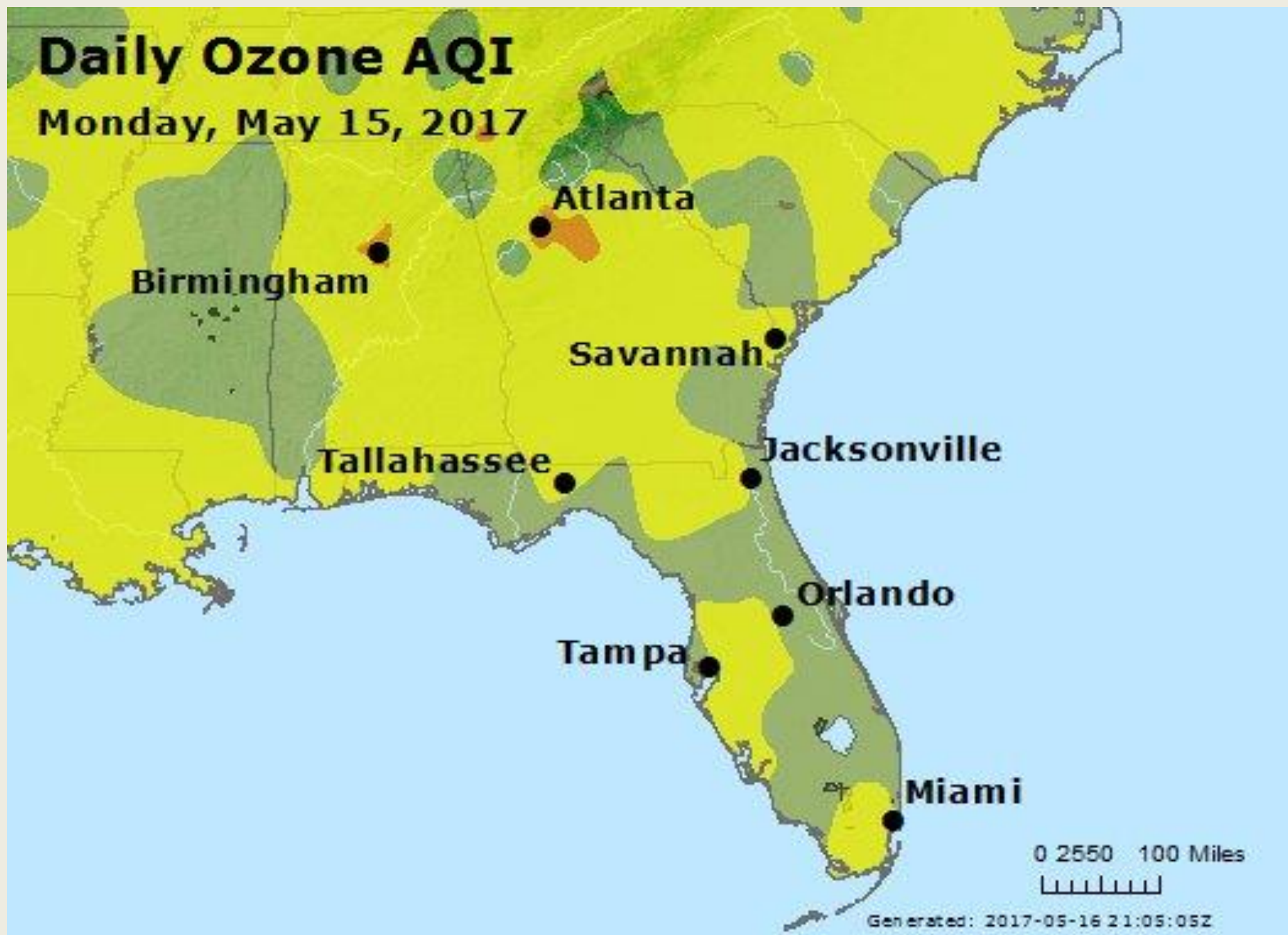
Orlando

Tampa

Miami

0 25 50 100 Miles

Generated: 2017-05-16 21:05:05Z



Conclusions

- The NOAA model did a good job of forecasting for North and Central Alabama over the summer of 2017.
- Typically as you progress farther south in Alabama, the forecast tends to be less accurate as you approach the Gulf of Mexico.
- We believe there needs to be more emphasis placed on dew points and land/sea breeze interaction along the coast.
 - What are NOAA's expectations for improvements with this?