Connecticut Department of Energy and Environmental Protection
# Ozone in Connecticut 2018

- **23 exceedance days in 2018 through September 20th**

<table>
<thead>
<tr>
<th>Site</th>
<th>2018 Exceedances</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>Sept</th>
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| # days > Federal Standard | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 |
Trend Graph - Exceedance Days

Number of Days Exceeding the Ozone NAAQS in Connecticut

- 70 ppb NAAQS
- 75 ppb NAAQS
- 84 ppb NAAQS
- Poly 3rd (70 ppb)
- Poly 3rd (75 ppb)
2018 Summer Precipitation Summary

- Overall, a wetter summer for the Northeast.
Summer Temperature summary

• Generally, above normal temperatures over the Northeast.

Avg Temperature Departure (°F)
June - August 2018
23 Days 90+ degrees at BDL Hartford
Higher Dewpoints Reflected in Minimum Temperatures

BDL Minimum Temperatures July- September 2018

- MinTemperature
- MinTemperatureNormal
Did I mention that there was a lot of smoke?

April 2018 HMS
Inland Monitors

Daily Maximum 8-Hour Ozone CT Inland Monitors

Ozone ppb

Danbury, East Hartford, Stafford, Cornwall, Middletown, 70 ppb NAAQS

Dates from 4/7/2018 to 9/30/2018
NOAA Model Performance

- The following charts were produced (mostly) from the 06z PROD Day 2 model runs;
- The model generally under predicted during May;
- Over predictions began in June and continued into late August, however there were several days of under predictions thrown in.
- The weather pattern was more tropical during July-August that allowed more mixing from the marine boundary layer.
June 2018 Events

June 17, 2018

June 18, 2018

June 30, 2018

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July 2018 Events

July 1, 2018

July 2, 2018

July 9, 2018

July 10, 2018

Energy and E
July 2018 Events

July 13, 2018

July 16, 2018

July 14, 2018

July 28, 2018

of Energy and E
August 2018 Events

August 6, 2018

August 8, 2018

August 7, 2018

August 16, 2018
2014 NEI V2 Model Runs

August 6, 2018

It appears that the latest NEIv2 has little effect on model output.

August 7, 2018
It appears that the latest NEIv2 has little effect on model output.
Bias Correction Reduces Ozone

Reducing the modeled ozone helps on some days, but not on others!
July 1, 2018 Ozone Event

Bias-corrected performed better, but day 1 showed no improvement in either.
July 1, 2018 Surface Analysis Animation

- Weak High pressure was anchored over the east coast, with a meso-low that tracked across Connecticut
July 1, 2018 NOAA Model vs. Observed Stratford

- The modeled numbers look realistic for a high-end event, but it appears that the ozone production stopped during the afternoon.
July 1, 2018 NOAA Model vs. Observed Madison

- These modeled numbers are not realistic for a high-end event.
July 1, 2018 Trajectories
We need more studies as to how smoke plumes affect both monitored and modeled ozone data.
LIS Minute Ferry Data

Starting monitoring in late May, 2018, but ferry broke down in late August, so we missed the August 27-29 event.

MV Park City, Bridgeport & Port Jefferson Ferry

278 feet long

50 Feet

Typical transit path for the Park City Ferry
The Model predicts ozone exceeding 106 ppb at 2100z (16:00EST), while the Ferry monitors levels between 90-100 ppb during the same time period.
Park City Ferry Hourly Ozone ppb
July 1, 2018
July 10, 2018 LIS Ozone

The minute ferry data does reach 140 ppb, so the model output at 2100z is fairly realistic on this day!
July 10, 2018 LIS Ozone

Time: 7/10/2018 05:55:00

5 Minute Ozone (ppb) Monitored on Ferry, July 10, 2018
Connecticut Ozone Event August 28, 2018
NOAA Model August 27, 2018 Day 2 for August 28th

06z Run

12z Run

06z Run

12z Run
NOAA Model August 28, 2018 Day 1

06z Run

12z Run

06z Run

12z Run
Conclusions

• 23 exceedance days in 2018, compared with 20 in 2017;

• The NOAA model generally under predicted in May, possibly due to smoke from agricultural fires;

• Tropical weather pattern set up in July, which tended to push highest ozone further west;

• When we know that NOAA model is over predicting, we generally lower the ozone levels by as much as 10-20 ppb.

• Smoke was present for several events during the summer, which may have hindered the model performance due to solar attenuation.