Message

From: Liljegren, Jennifer [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C7098A838CD34F75B8878571FE95D939-JLILJEGR]
Sent: 3/14/2018 12:44:54 PM
To: Simon, Heather [Simon.Heather@epa.gov]
Subject: ozone comments regarding wind roses vs. HYSPLIT
Attachments: wi_120d_tsd_rewrite_final.pdf; WI 2015 Ozone NAAQS Designations TSD 042017.pdf; DNRResponse120DayLetter20180228.pdf

Hi Heather,

I hope you are having a good day.

Thank you again for your help with assessing the western Michigan modeling. We ended up briefing our management on it yesterday.

I had another request. I am wondering if you or someone you know at OAQPS would be able to provide any technical information to help in defending EPA's use of the HYSPLIT modeling in the contribution analysis for the eastern Wisconsin areas? Below is a summary of the comments we received. I am also attaching Wisconsin DNR's original TSD and comment letter TSD as well as EPA's 120-day TSD for reference.

The wind roses pasted below are also in the attachments and start on page 26 in DNR's TSD— "WI 2015 Ozone NAAQS Designations TSD 042017.pdf"
and are on pages A8-A9 in the DNR comment letter — "DNRResponse120DayLetter20180228.pdf"

Thanks,
Jenny

Summary of comments:

> Wind rose analyses, more accurately reflect the complex lakeshore environment than does the HYSPLIT back trajectory model relied upon by EPA, and confirm that ozone concentrations exceeding 70 ppb occur when winds originate offshore. EPA inappropriately relied on HYSPLIT back trajectories to make a connection between local emissions and locally-monitored ozone levels. WDNR believes that only the 100 m HYSPLIT back trajectories are potentially relevant when considering associations with ground-level monitored ozone levels. Most traveled over the lake (high level 500 m and 1,000 m HYSPLIT represent synoptic and not local flow). In contrast, direct measurements at these monitors found that, for virtually every single hour with ozone concentrations above 70 ppb, the air masses came from over the lake: from 155-185 degrees for the Harrington Beach monitor and 135-175 degrees for the Grafton monitor. The wind roses from the other lakeshore monitors showed similar results: ozone-rich air was delivered to the monitors almost exclusively from over Lake Michigan (i.e. from emissions originating outside the state of Wisconsin). This comparison conclusively shows that HYSPLIT underestimates the role of the lake in delivering ozone-rich air to this monitor and overestimates the impact of emissions from inland portions of the counties under discussion. Wisconsin believes that emissions originating in Wisconsin are not meaningfully impacting the violating monitors along the shoreline in Wisconsin.

Figure 5.1. Ozone pollution roses for hours with ozone above 70 ppb (left) and maps of monitor locations for lakeshore monitors (right). In the pollution roses, the length of the paddle shows the percentage of hours with winds from that direction, and the color corresponds to the average ozone concentration during those hours. The blue line in both figures shows an estimate of the shoreline angle, and the red arrow shows the angle of the dominant wind direction at that monitor. Map scales vary somewhat between maps.

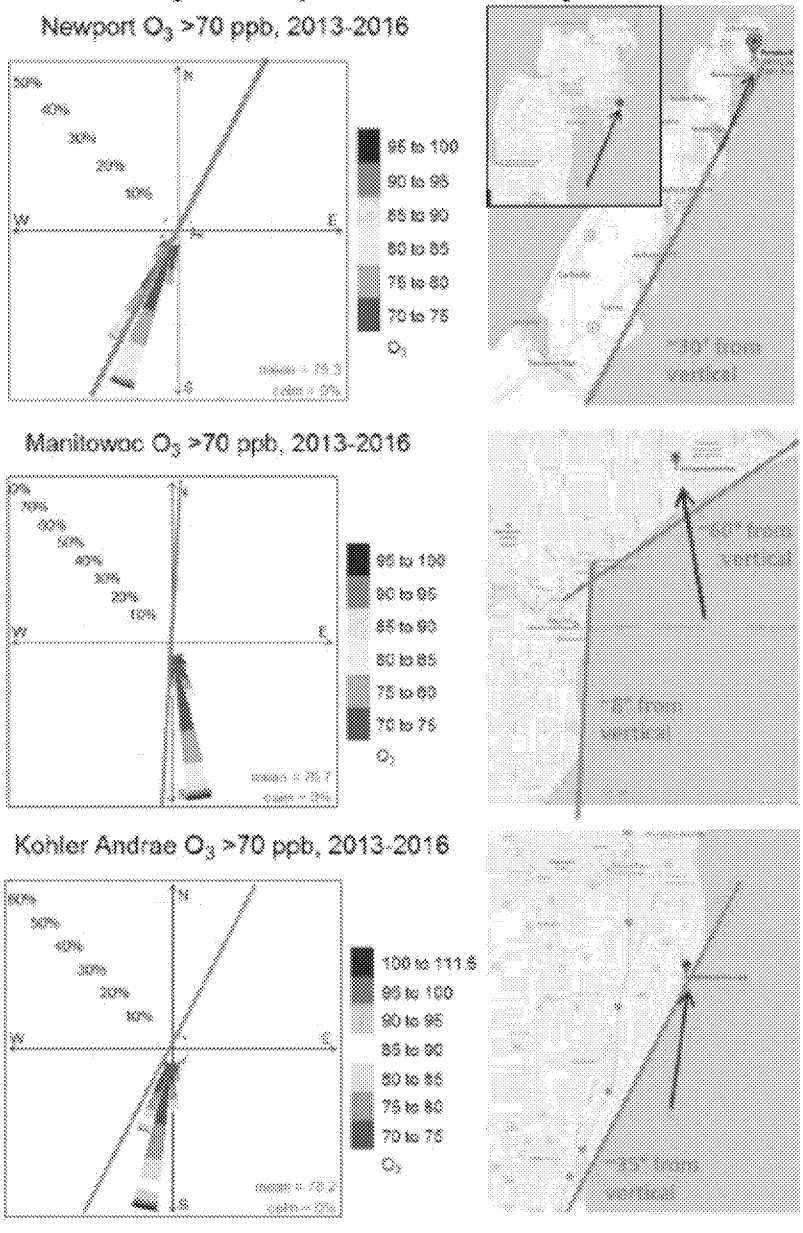
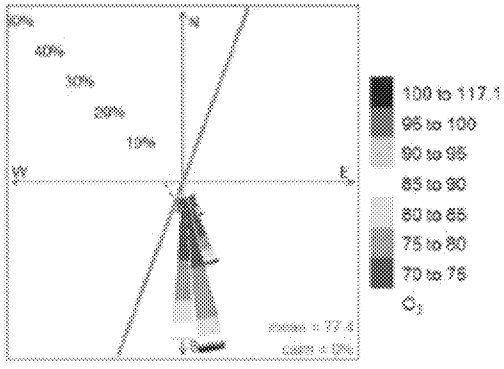
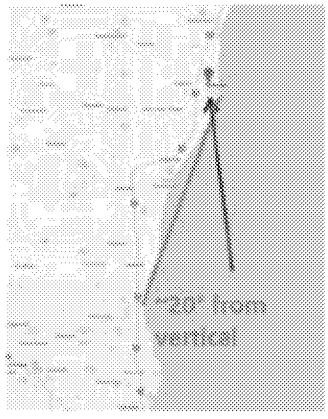


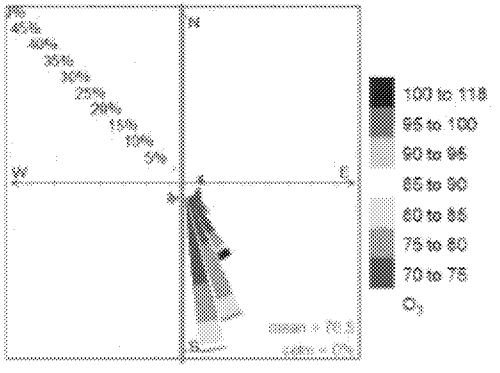
Figure 5.1. (continued)

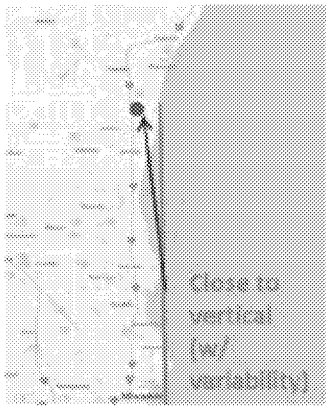
Harrington Beach O_3 >70 ppb, 2013-2016



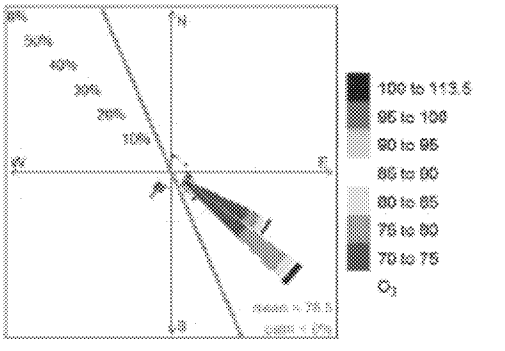


Grafton O_3 >70 ppb, 2013-2016





Milw SER O_3 >70 ppb, 2013-2016



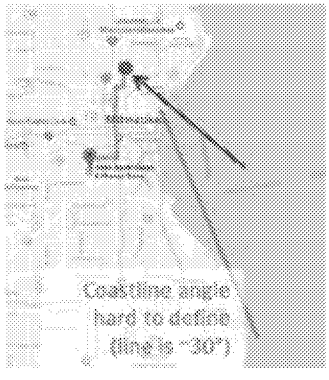
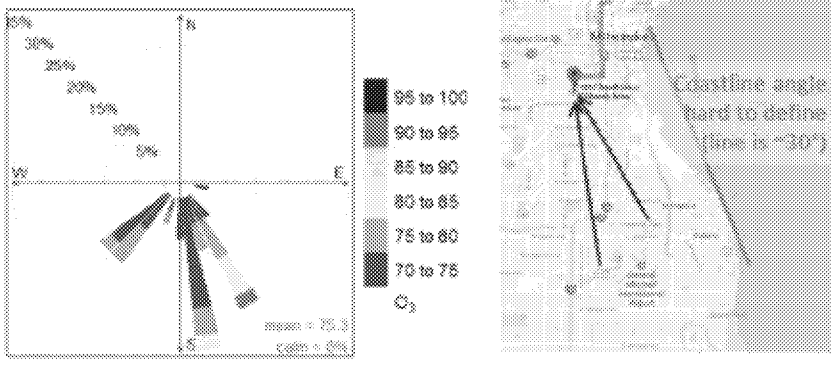
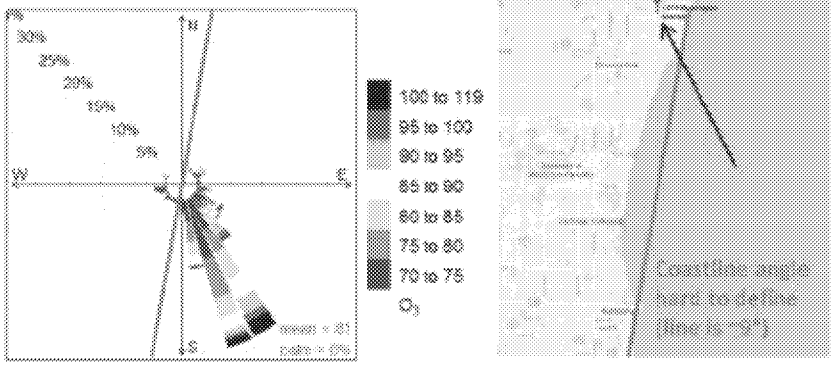


Figure 5.1. (continued)*

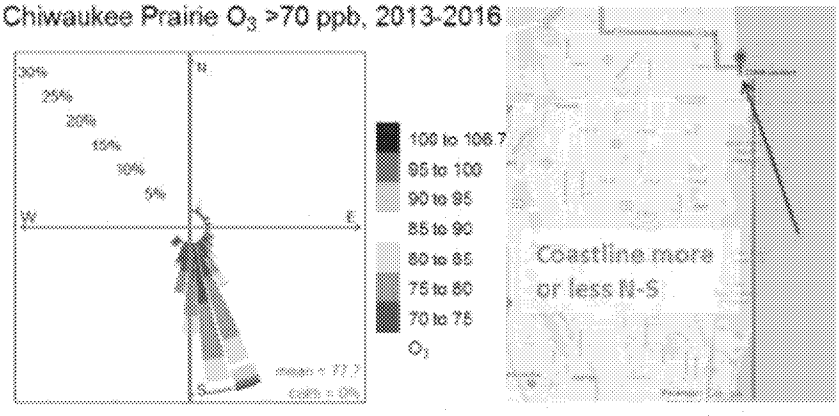
Milw Health Center O_3 >70 ppb, 2013-2016



Racine O_3 >70 ppb, 2010-2013



Chiwaukee Prairie O_3 >70 ppb, 2013-2016



*Wind data is not collected at the currently operating Racine Payne and Dolan monitor, so the Racine pollution rose plots data from the old Racine monitor for the years 2010-2013.

Figure 7. Comparison of EPA's HYSPLIT back trajectory analysis and DNR's pollution rose analysis for all monitors with wind direction data. No HYSPLIT data is shown for the Milwaukee monitors because EPA did not run the model for these attaining monitors. The red lines in the HYSPLIT plots correspond to air parcels ending at 100 m elevation, blue to air parcels at 500 m, and green to air parcels at 1000 m.

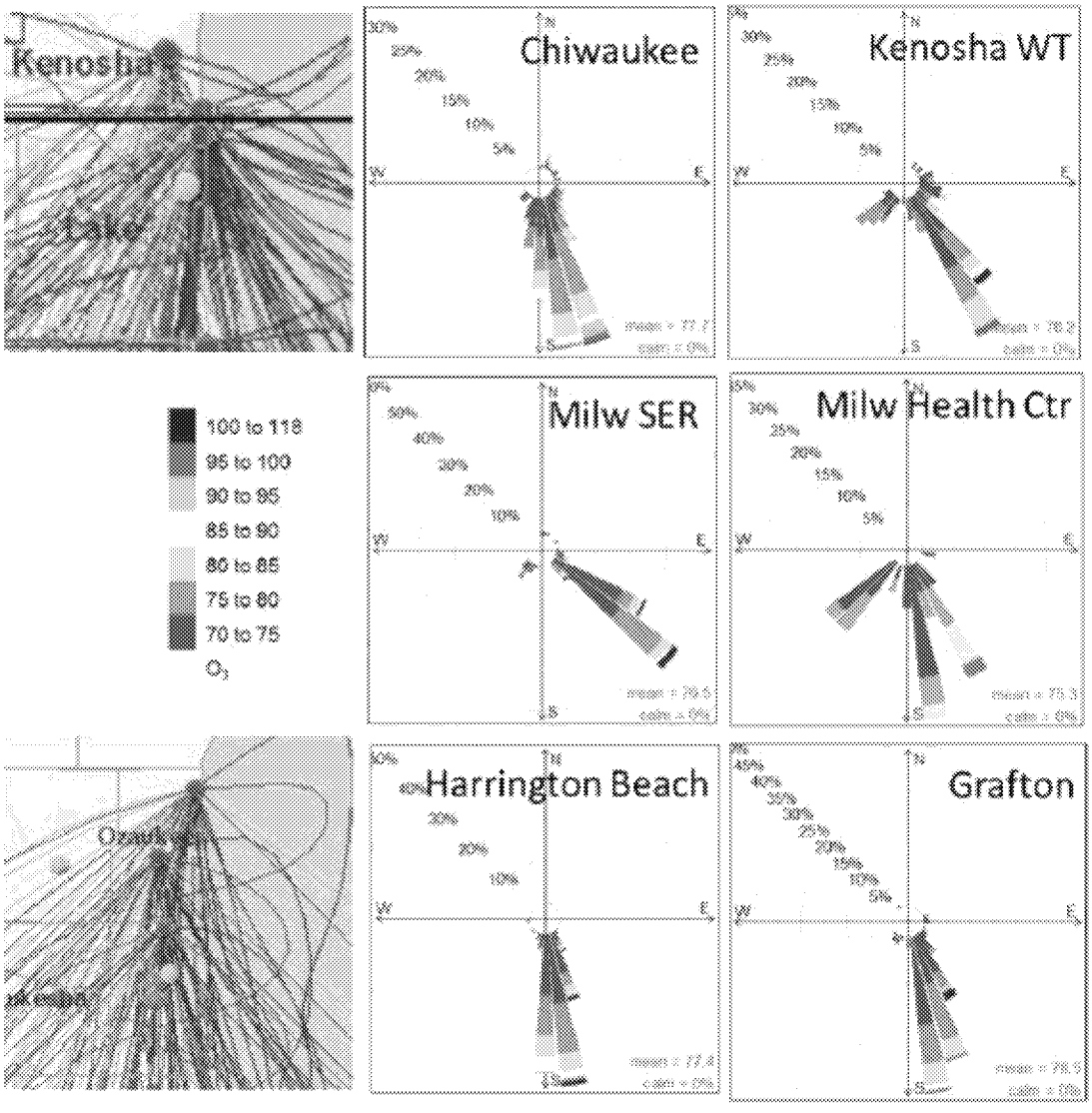
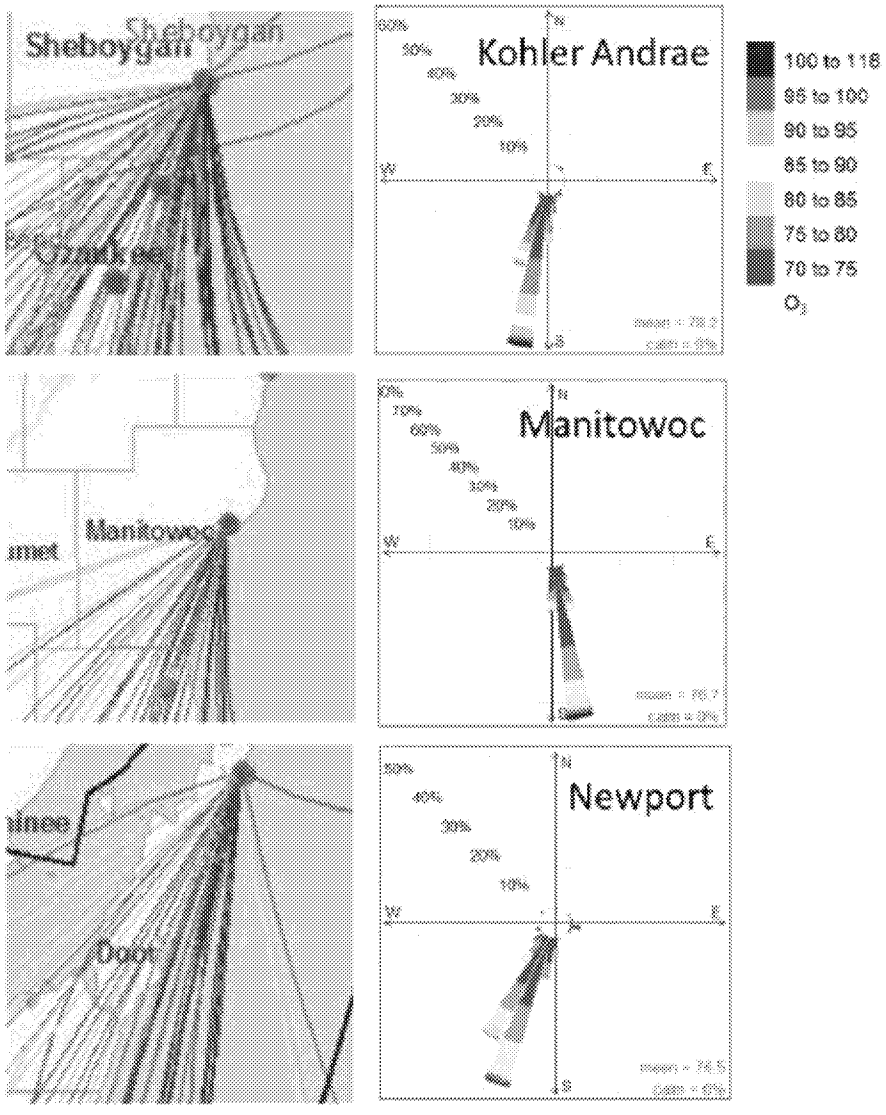



Figure 7 (continued).