Comments from

Clark County Department Of Air Quality

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Outline

- An operational forecaster perspective, for product developers.
- Air quality meteorology factors affecting Las Vegas, Nevada as an example of a continental, mountain and valley setting.
- Recent history of AQI statistics – the battle isn't over yet.
- A question on the role of atmospheric moisture in ozone formation.
- Feedback on 72-hour products.

Operational Forecaster Perspective

(possibly obvious)

- We appreciate the work by the product developers and support team to improve the information we use in our work. These workshops are a welcome opportunity to exchange information.
- Some of us have multiple responsibilities, so having readily accessible user-friendly information for first thing in the morning is essential.
- Forecast updates can be based on near-real-time weather and AQ data, and rapid update weather models, rather than the AQ model updates.
- The 72-hour product would help day-to-day and weekend periods.

Desert SW U.S. mountain/valley

- Setting: Las Vegas base elevation approximately 2,200 ft msl, with mountains above 10,000 ft on west and north, lesser to east and south
- *850 mb winds are good indicator of local and regional transport*
- Weak synoptic and regional pressure gradients lead to terrain-driven diurnal wind cycle, with significant ozone variations around the valley. Multiple day periods tend to increase ozone and PM2.5 levels.
- Multi-day summer stagnation in central and southern California followed by an approaching trough system cause SW airflow and transport. Then local clear sky solar can cause exceedances.
- PM exceedances occur with regional scale winds over 40 mph or nearby large thunderstorm outflow.
- Regional and local wildfire smoke certainly increases ozone and PM2.5
- *Single-site exceedances can be due to very localized emission influences*

Clark County Department of Air Quality Stations in the Greater Las Vegas Valley

Days per year in the AQI levels

	Good	Mod	USG	Unh	Very Unh	Haz
2012	129	201	34	2	0	0
2013	139	199	25	2	0	0
2014	142	211	10	2	0	0
2015	163	187	15	0	0	0
2016	144	203	18	0	1	0

Clark County Department of Air Quality Stations in the Greater Las Vegas Valley

Pollutant determining the AQI

	CO	O3	SO2	NO2	PM2.5	PM10
2012	0	246	0	11	100	9
2013	0	217	0	14	125	9
2014	0	225	0	3	127	10
2015	0	225	0	14	123	3
2016	0	208	0	25	128	5

Curious about role of moisture in net ozone production

- Unusually humid “monsoon” period this summer kept dew point above 40-45F for weeks; normal summer levels are at least 20F lower.
- Nocturnal rain events during dry periods followed by clear skies in daytime causes evaporation and near-surface moisture.
- With higher humidity in the surface layer, ozone levels increase in the morning faster than normal, and could exceed NAAQS level if cumulus development did not occur in time to shut off the incoming solar mechanism.
- So I would appreciate knowing some quantitative factors on the moisture influence.

Comments welcome on our time forecast periods

- Forecast by AQI category with short discussion,
- Issued early in morning, period includes today plus four days for our own web site, and today plus five days for AirNow-Tech.
- Confidence decreases beyond 2-3 days, so we do not tend to forecast USG or issue advisory this far away.
- The increased time period to 72 hours for NOAA model should help