

Analyzing Utah Division of Air Quality Forecasts of Ozone Near the Great Salt Lake during Summer 2021

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Background

- Utah Division of Air Quality (DAQ) forecasts air quality for public health
- DAQ often finds it difficult to predict ozone concentrations within the summer

Objectives

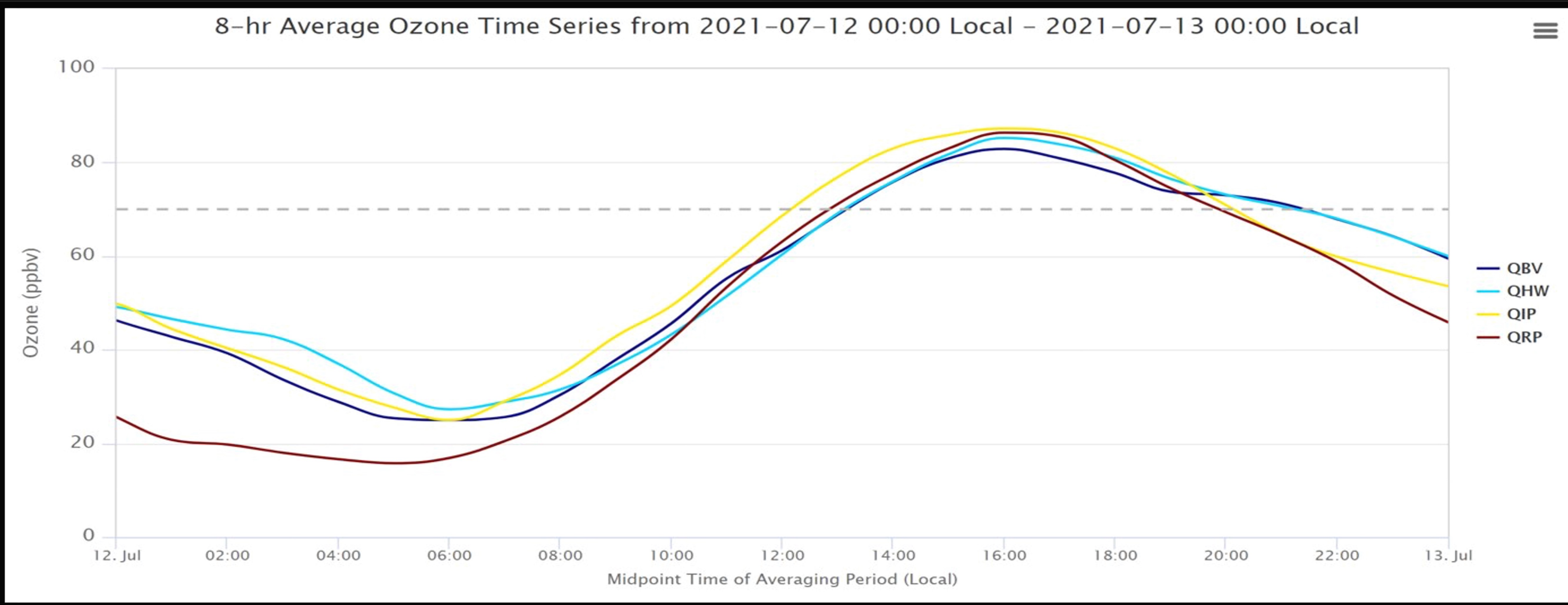
Determine the accuracy of DAQ ozone forecasts of high ozone periods (>80ppbv) during Summer 2021

Data Collection & Methods

- Data collected from Utah DAQ fixed sites utilizing MesoWest Interface:**
 - Obtained ozone concentrations during June 4 to July 16, 2021
 - Collected 43 1-day ozone forecasts <https://air.utah.gov/forecast.php>
- MesoWest Utah Air Quality – Time Series**
 - Real-time, fixed site data collection sites from four locations
 - Processed into MesoWest database and website
 - <https://utahaq.chpc.utah.edu/aq/>
 - Collected data on excel spreadsheet
- Locations:** Bountiful (QBV), Inland Port (QIP), Hawthorne (QHW), & Rose Park (QRP)



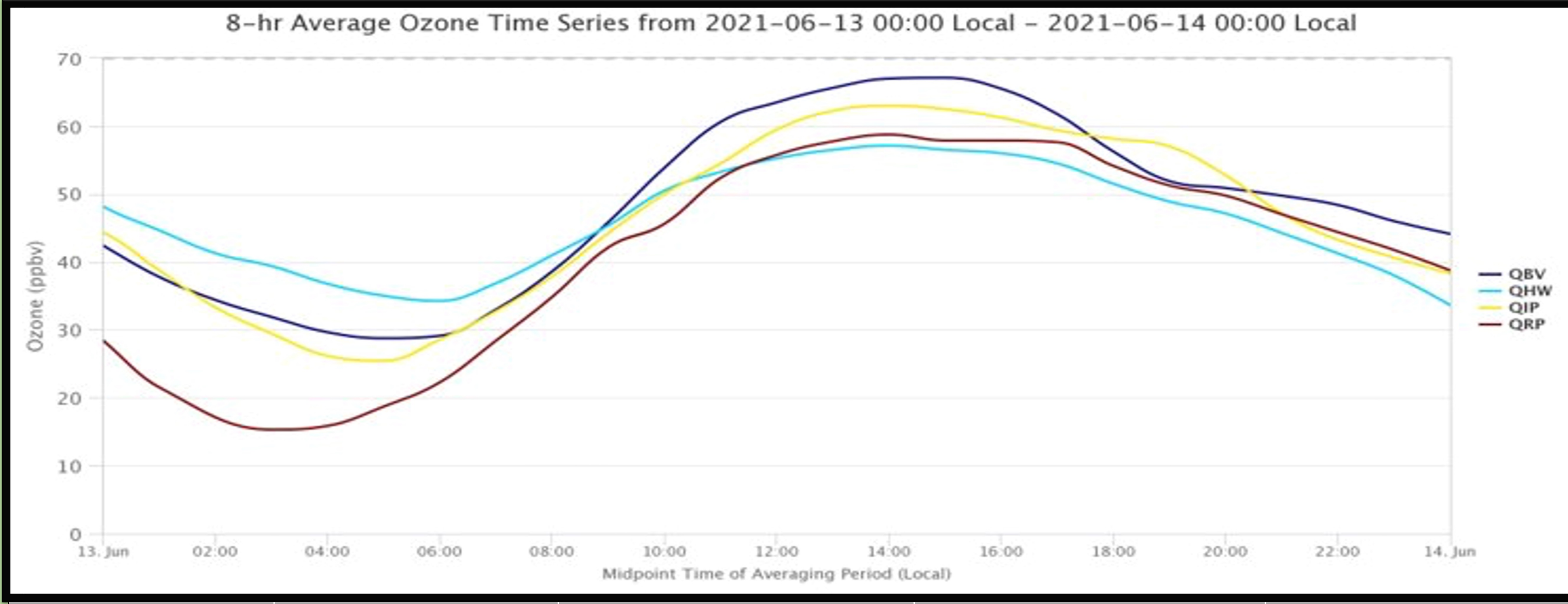
Case Study: July 12, 2021



	Bountiful (QBV)	Inland Port (QIP)	Hawthorne (QHW)	Rose Park (QRP)
Ozone at 2000UTC (ppbv)	91	95	87	95
DAQ forecast	Unhealthy	Unhealthy	Unhealthy	Unhealthy

All 4 locations (QBV, QIP, QHW, and QRP), were forecasted **accurately**

Case Study: June 13, 2021



	Bountiful (QBV)	Inland Port (QIP)	Hawthorne (QHW)	Rose Park (QRP)
Ozone at 2000UTC (ppbv)	90	62	67	70
DAQ forecast	Unhealthy	Unhealthy	Unhealthy	Unhealthy

- 3 of 4 locations (QIP, QHW, and QRP), the DAQ **over forecasted** the event
- Action Required should have been Moderate w/ Voluntary Action
- QBV DAQ forecast was **accurate**

Results: DAQ Forecast Prediction Accuracy

		FORECAST			
O B S E R V A T I O N	Observation / Forecast	Good	Moderate	Unhealthy	Total
	Good	2	0	0	2
	Moderate	0	12	15	27
	Unhealthy	0	7	7	14
	Total	2	19	22	43

Data Collection Period: 43 days, June 4 to July 16, 2021

Observed Forecasts

- 2 Good
- 19 Moderate
- 22 Unhealthy

DAQ Forecasts Accuracy

- 21 Accurate
- 15 Over
- 7 Under

Action Forecast	Health Forecast		
	Air Quality Index (AQI)	PM 2.5	Ozone
Unrestricted Action	Good	0 - 12.0 $\mu\text{g}/\text{m}^3$	0 - 0.054 ppm
Voluntary Action	Moderate	12.1 - 35.4 $\mu\text{g}/\text{m}^3$	0.055 - 0.070 ppm
	Unhealthy for Sensitive Groups	35.5 - 55.4 $\mu\text{g}/\text{m}^3$	0.071 - 0.085 ppm
Mandatory Action	Unhealthy	55.5 - 150.4 $\mu\text{g}/\text{m}^3$	0.086 - 0.105 ppm
	Very Unhealthy	150.5 - 250.4 $\mu\text{g}/\text{m}^3$	0.106 - 0.200 ppm
	Hazardous	Above 250.5 $\mu\text{g}/\text{m}^3$	Above 0.201 ppm

Based on a 24-hour average. Based on an 8-hour average.

Summary & Future Work

This study helps to prepare for a Summer 2022 field study on high ozone periods in the Great Salt Lake Area

References & Acknowledgements

- John Horel, Eric Crosman, Alexander Jacques, Brian Blaylock, Seth Arens, Ansley Long, John Sohl, Randal Martin (2016): Summer ozone concentrations in the vicinity of the Great Salt Lake, Atmospheric Science Letters/Volume 17, Issue 9/p. 480-486, DOI:10.1002/asl.680
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