



# Responses to Follow-Up questions from RASTF Data Analysis September Presentation

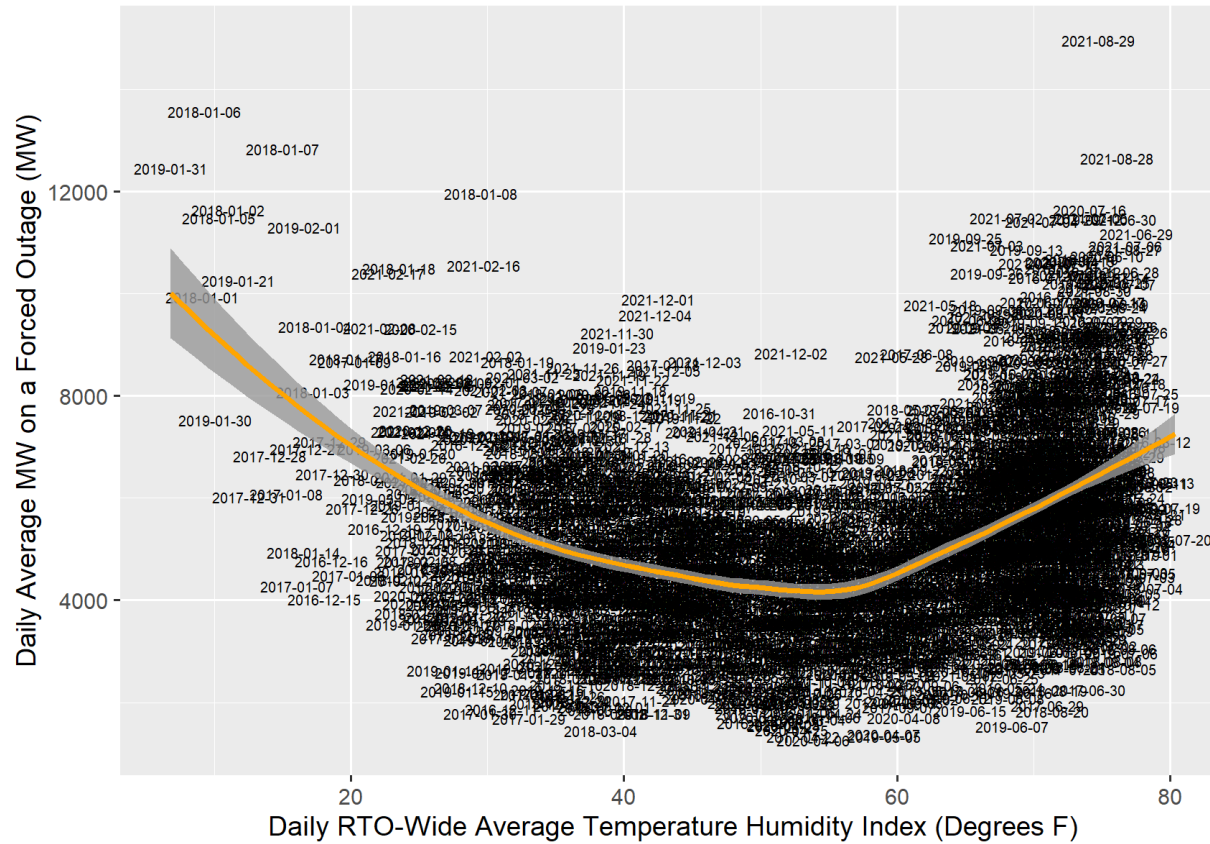
Patricio Rocha Garrido  
Resource Adequacy Planning  
RASTF  
September 22, 2022

- Daily Average MW on a Forced Outage vs Daily RTO-Wide Average Temperature Humidity Index graphs using post-CP implementation data (all cause codes included)
  - Restricting data to 2016-2021
  - Restricting data to 2018-2021



# Weather Dependent Forced Outages

Analysis of GADS forced outages data in period **2016**-2021 (excluding retired units)



Historically, colder temperatures have caused a larger amount of forced outages.

Warmer temperatures also seem to cause a larger amount of forced outages (the graph has a bathtub shape)

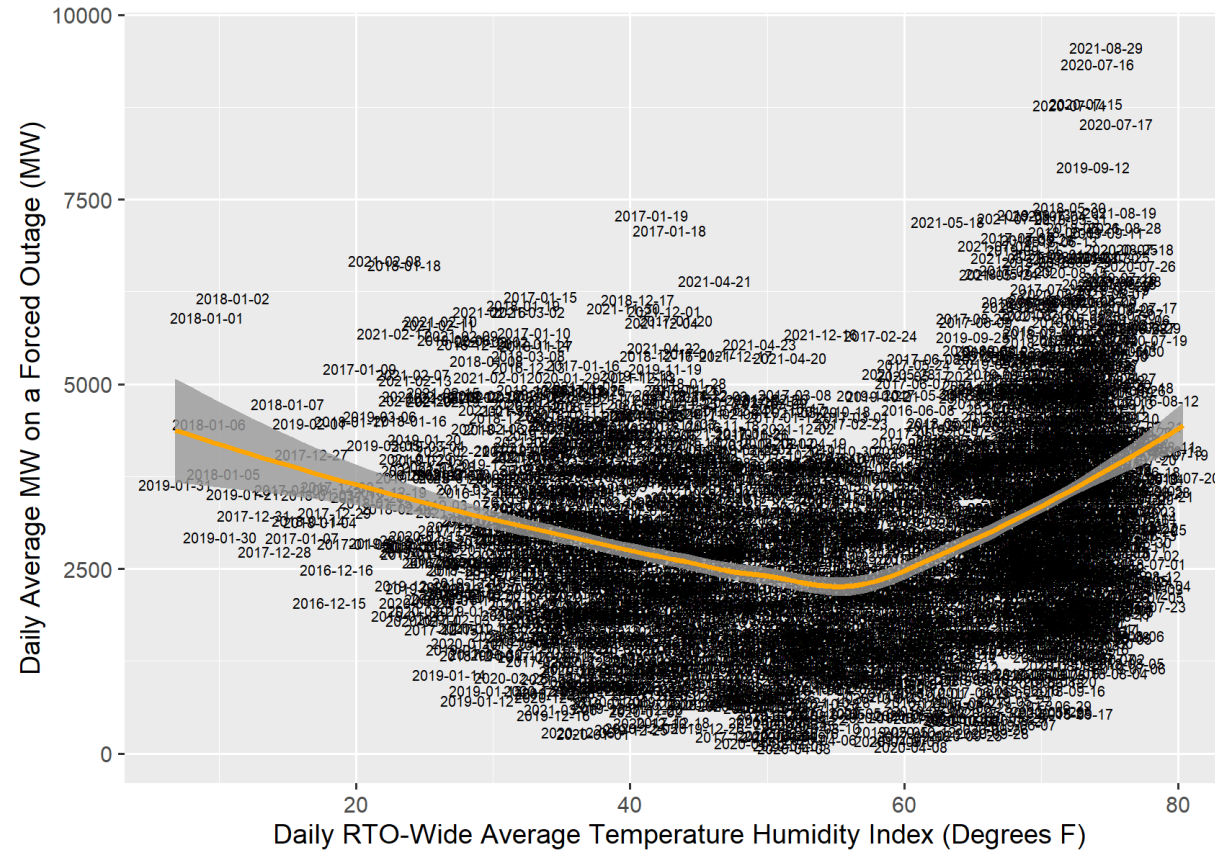






# Weather Dependent Forced Outages

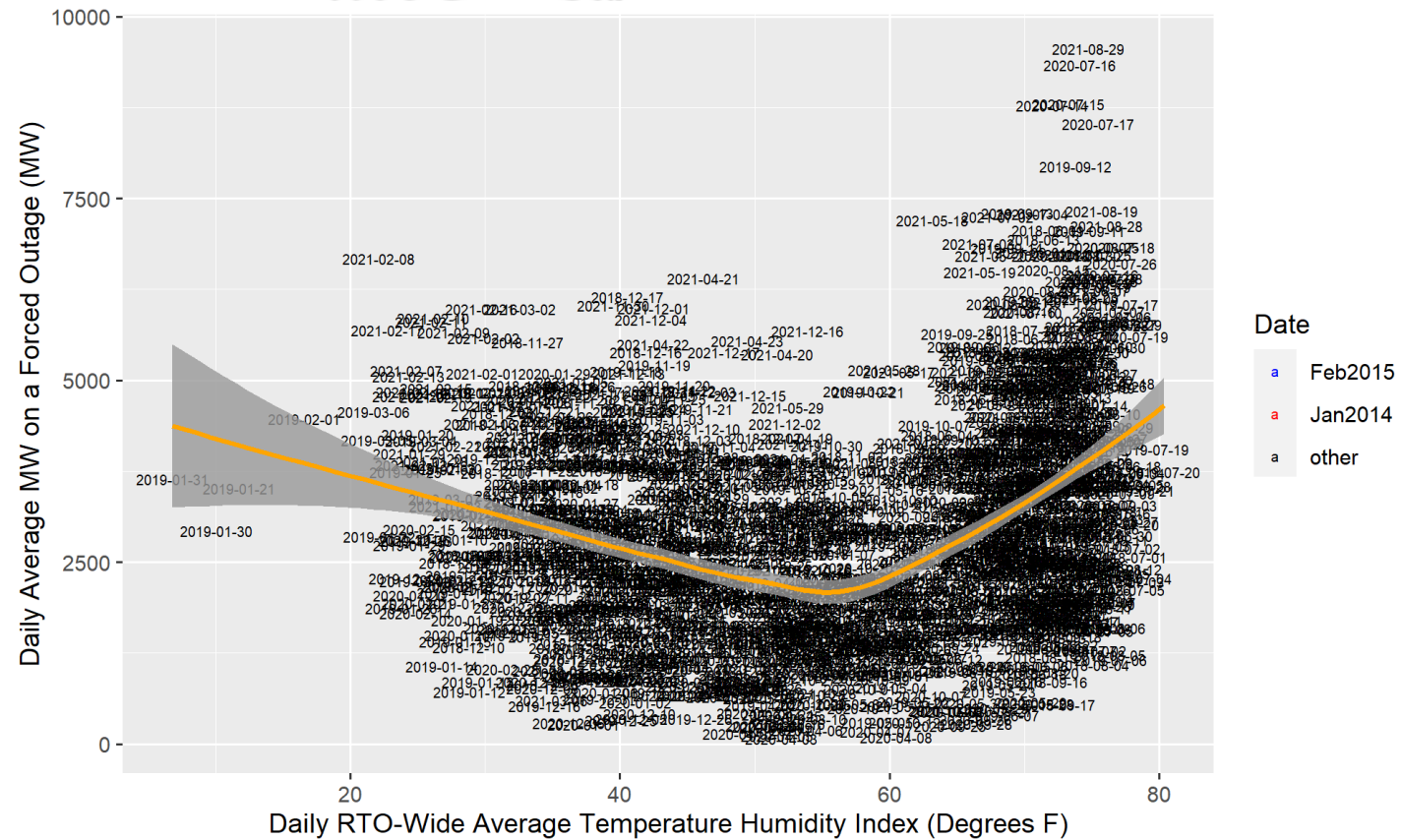
Analysis of GADS forced outages data in period **2016-2021** (excluding retired units) – **Coal only**





# Weather Dependent Forced Outages

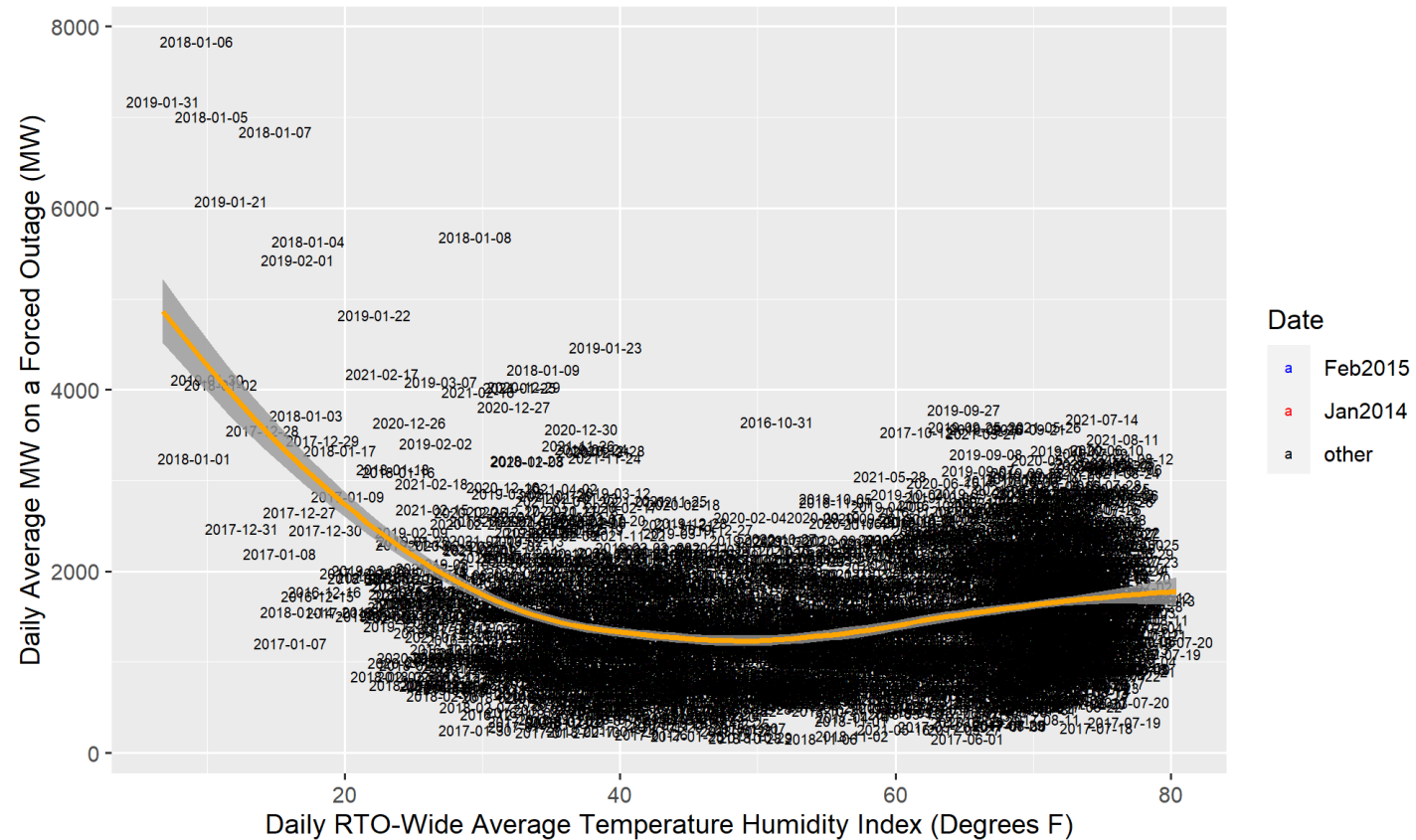
Analysis of GADS forced outages data in period **2018-2021** (excluding retired units) – **Coal only**





# Weather Dependent Forced Outages

Analysis of GADS forced outages data in period **2016-2021** (excluding retired units) – **Natural Gas only**



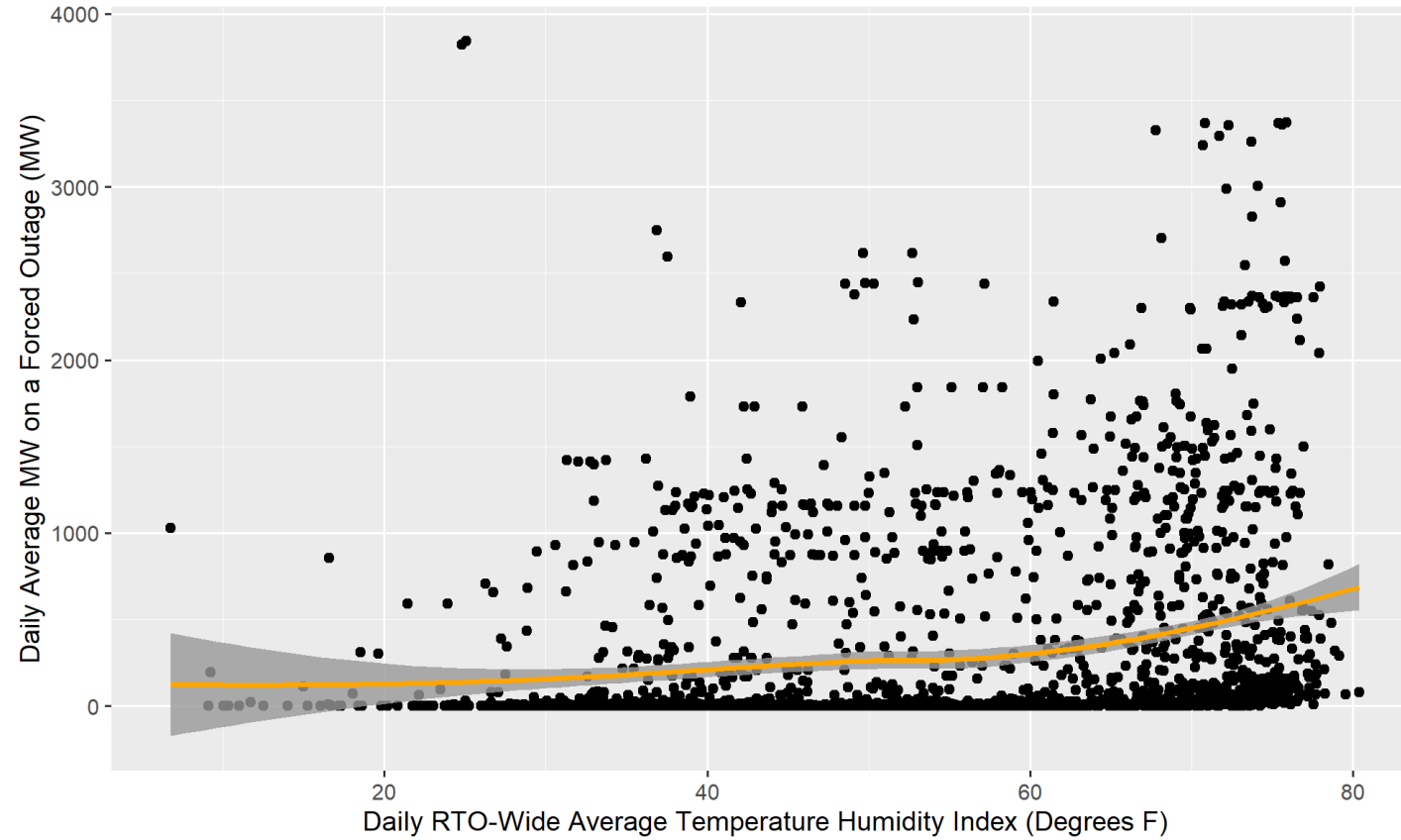




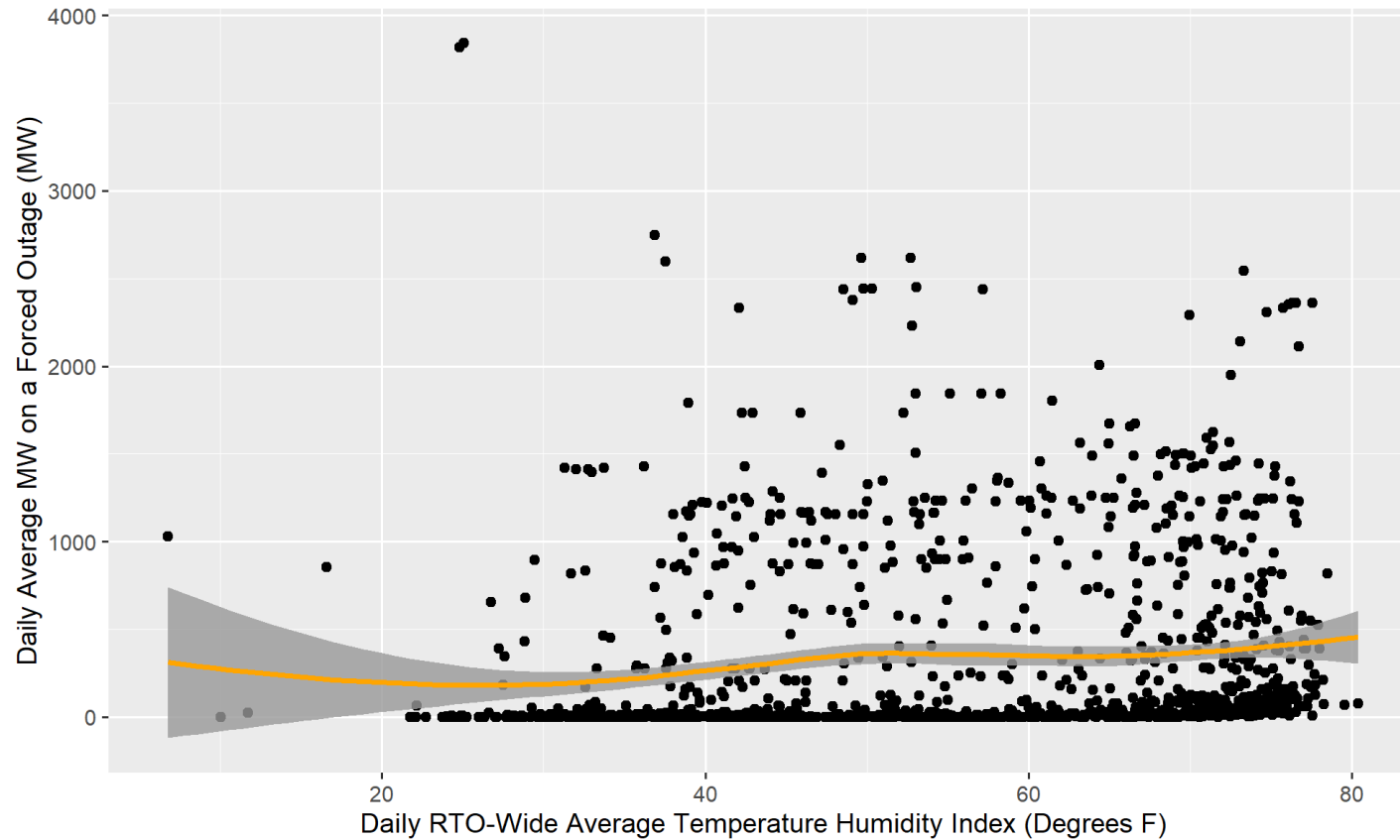


# Weather Dependent Forced Outages

Analysis of GADS forced outages data in period **2016-2021** (excluding retired units) – **Nuclear only**



Analysis of GADS forced outages data in period **2018-2021** (excluding retired units) – **Nuclear only**

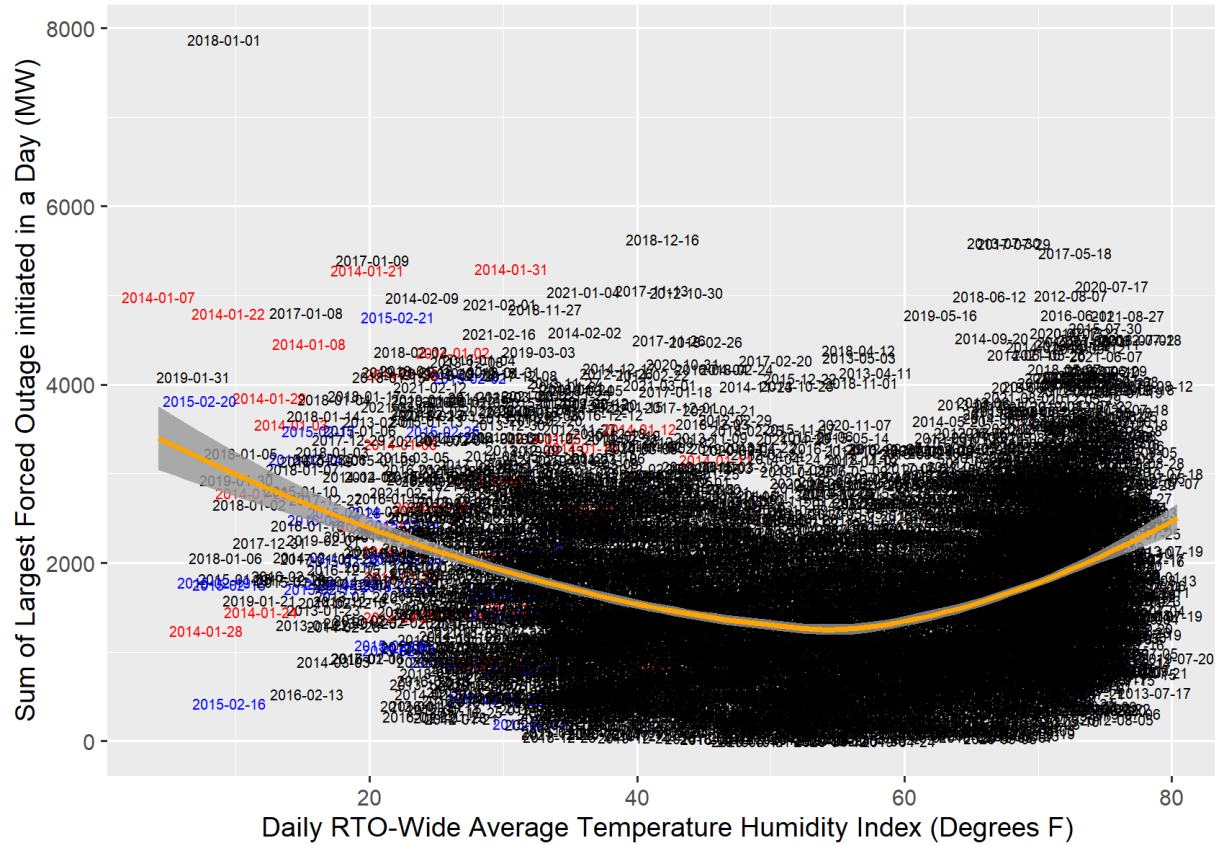


- The previous graphs (and the graphs presented at the September RASTF) show Daily Average MW on a Forced Outage
  - Daily Average MW on a Forced Outage is a good metric to capture long-duration outages that may occur at different times for different units (for instance, during a cold snap, some units may experience the outage on the first day, others on the second day and during the third day is when the impact on the system is felt)
- To supplement the above metric, the following are graphs showing the Sum (across all units) of the Largest Forced Outage initiated by a unit in a Day vs Daily RTO-Wide Average Temperature Humidity Index
  - These graphs more directly attempt to capture the relationship between temperature and the occurrence of a forced outage

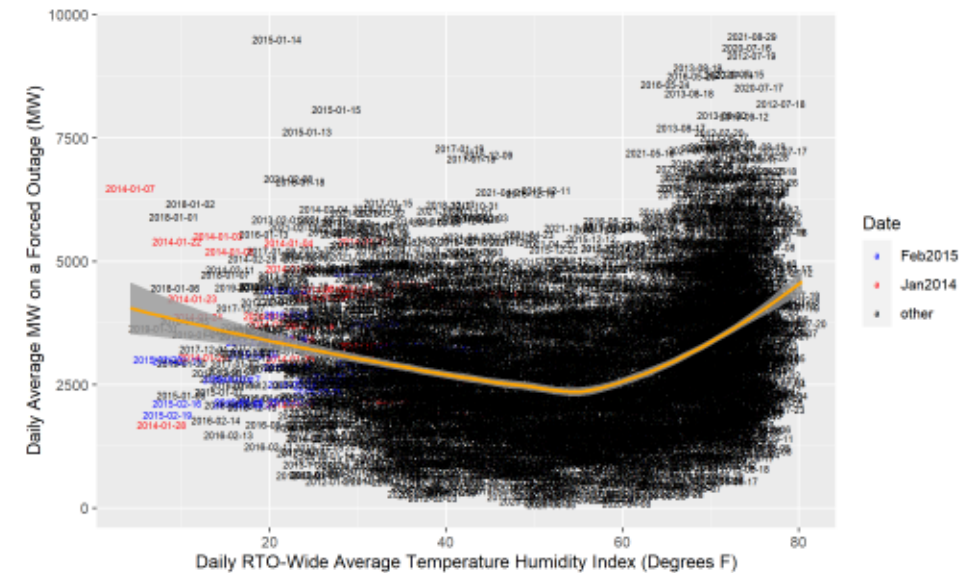




Analysis of GADS forced outages data in period 2012-2021 (excluding retired units) – **Coal only**

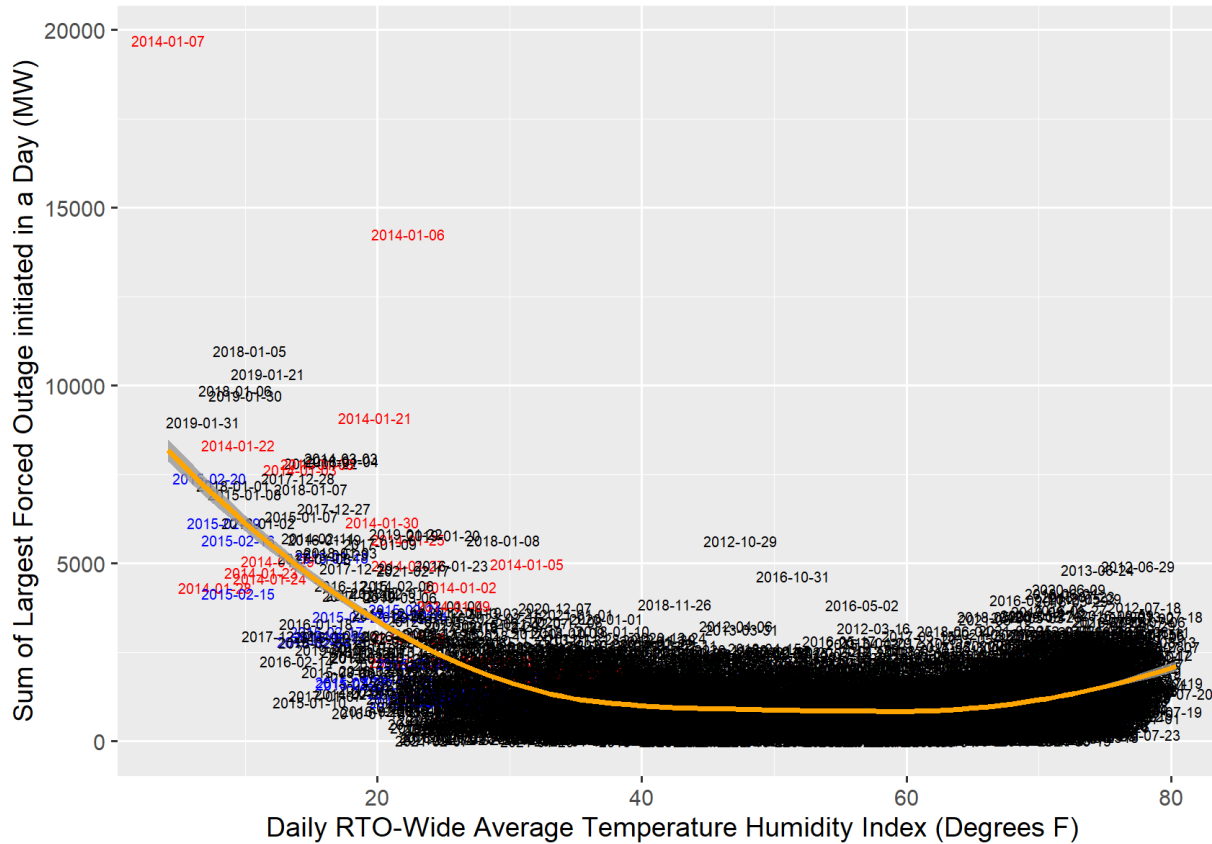


Shown at the September 2022 RASTF:



The trend is milder on both extremes in the left-hand side graph

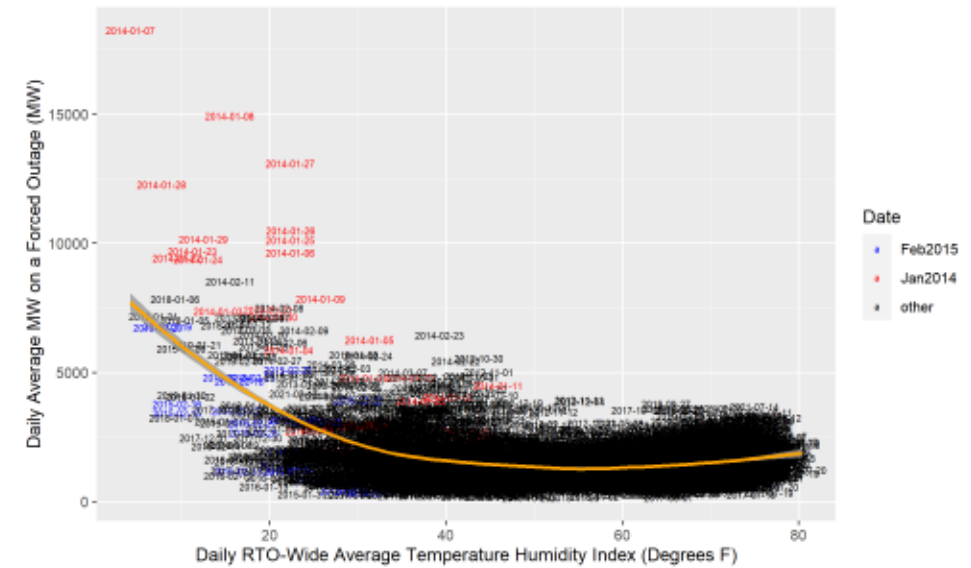
Analysis of GADS forced outages data in period 2012-2021 (excluding retired units) – **Natural Gas only**



Date

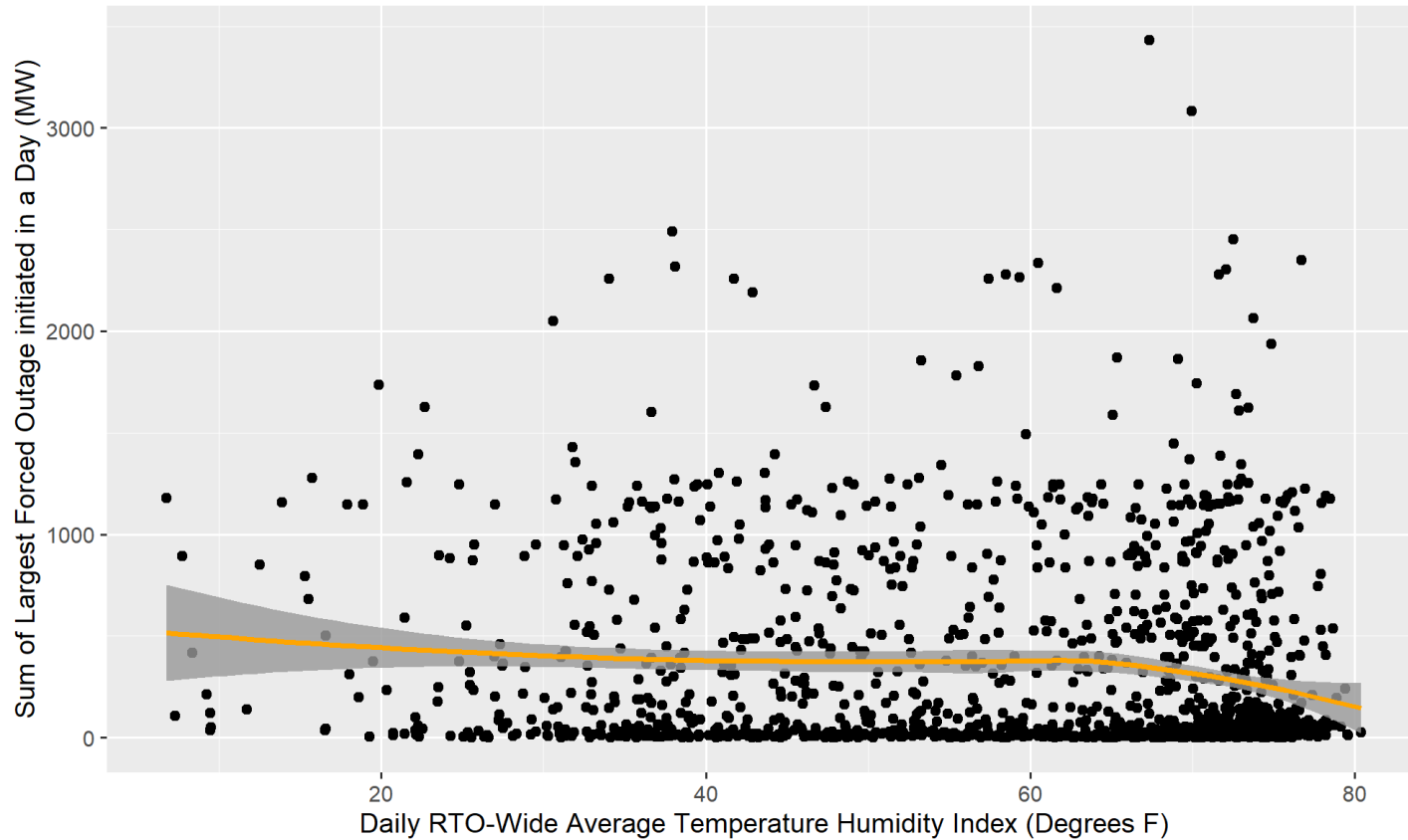
- a Feb2015
- a Jan2014
- a other

Shown at the September 2022 RASTF:

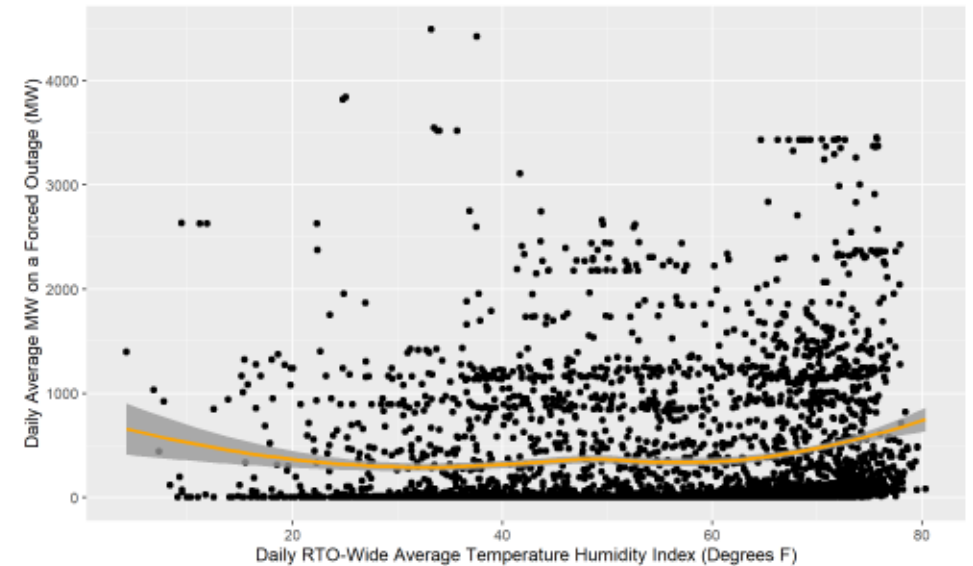


Both graphs show a similar trend

Analysis of GADS forced outages data in period 2012-2021 (excluding retired units) – **Nuclear only**



Shown at the September 2022 RASTF:



Trends differ in both graphs. In the left-side graph, there is no upward trend in any of the extremes

- Resource Performance during recent May-June-July Hot Weather Alerts
- There was an issue with the dates listed at the September 2022 RASTF. The dates listed were those in which the alert was issued but not the dates that were the **subject** of the alert. The corrected list of dates is:

~~— May 27, 2022~~ **May 31, 2022**

~~— June 29, 2022~~ **June 30, 2022**

~~— July 19, 2022~~

– July 20, 2022

– July 21, 2022

– July 22, 2022

– **July 23, 2022**

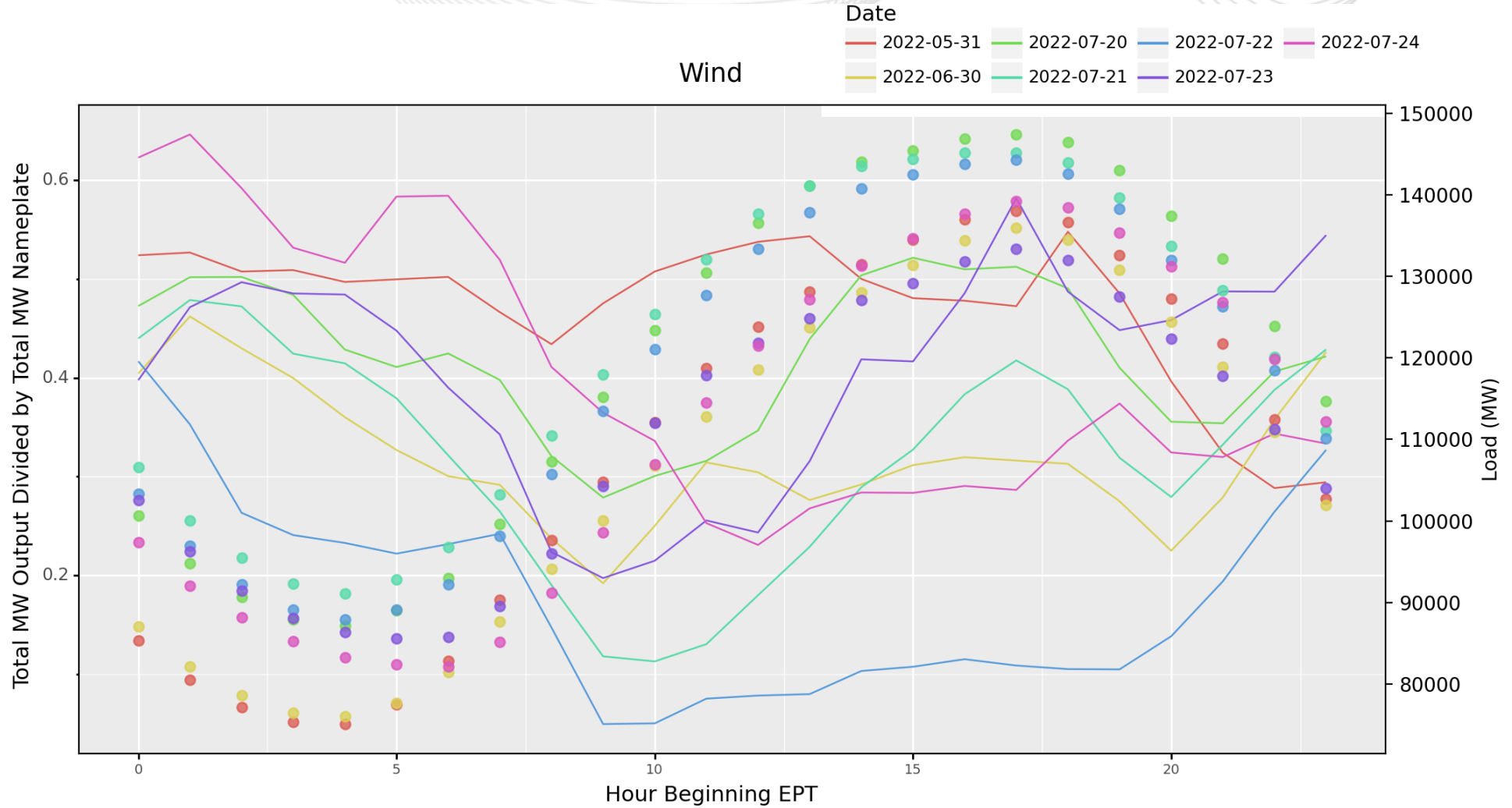
– **July 24, 2022**



- To each of the resource performance graphs, the hourly metered load values were added.
  - The y-axis on the left side and the lines are associated with the hourly resource performance in each of the days
  - The y-axis on the right side and the dots are associated with the hourly metered load values in each of the days

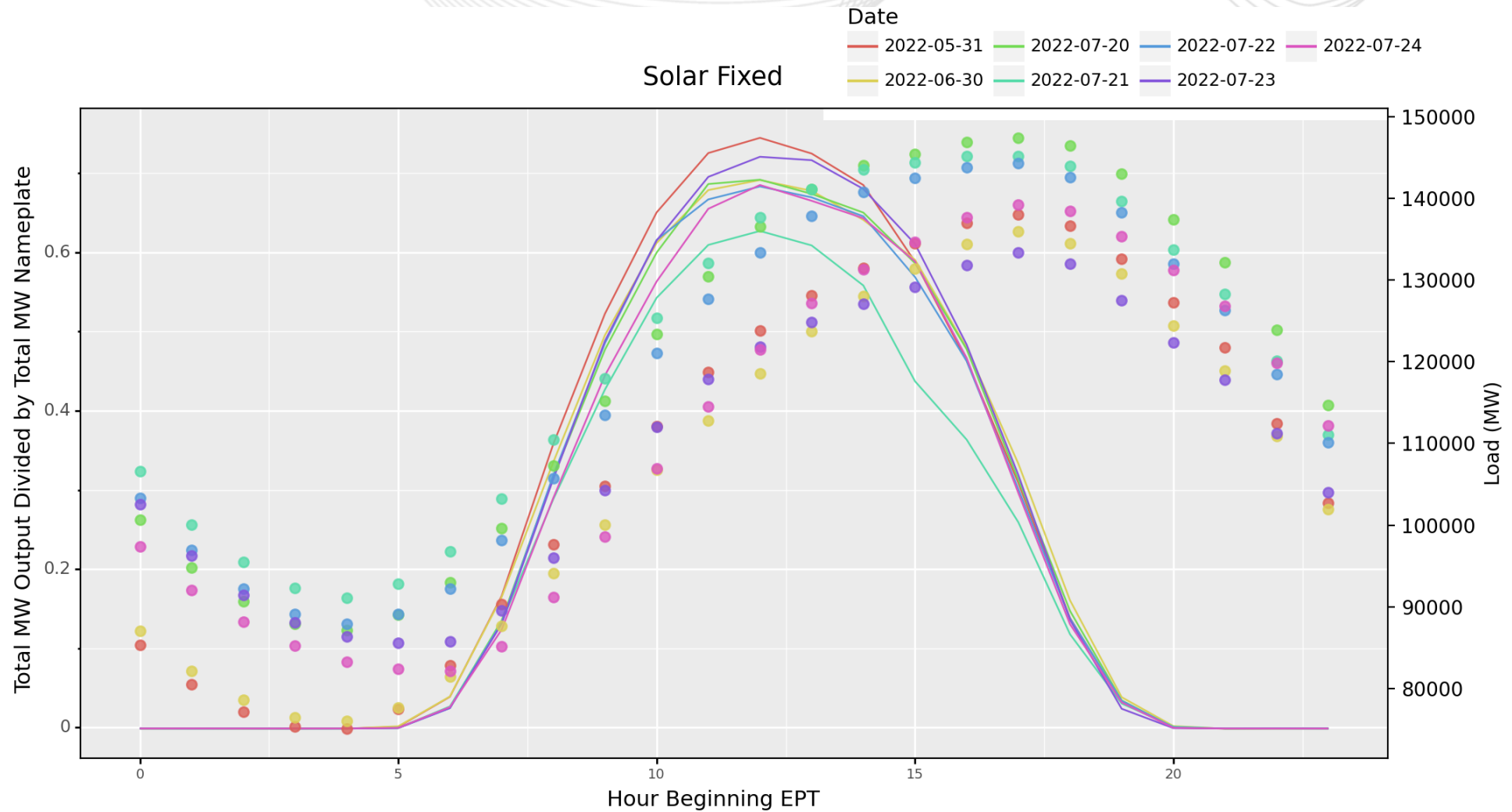


# Wind Performance during May/June/July/Hot Weather Alerts



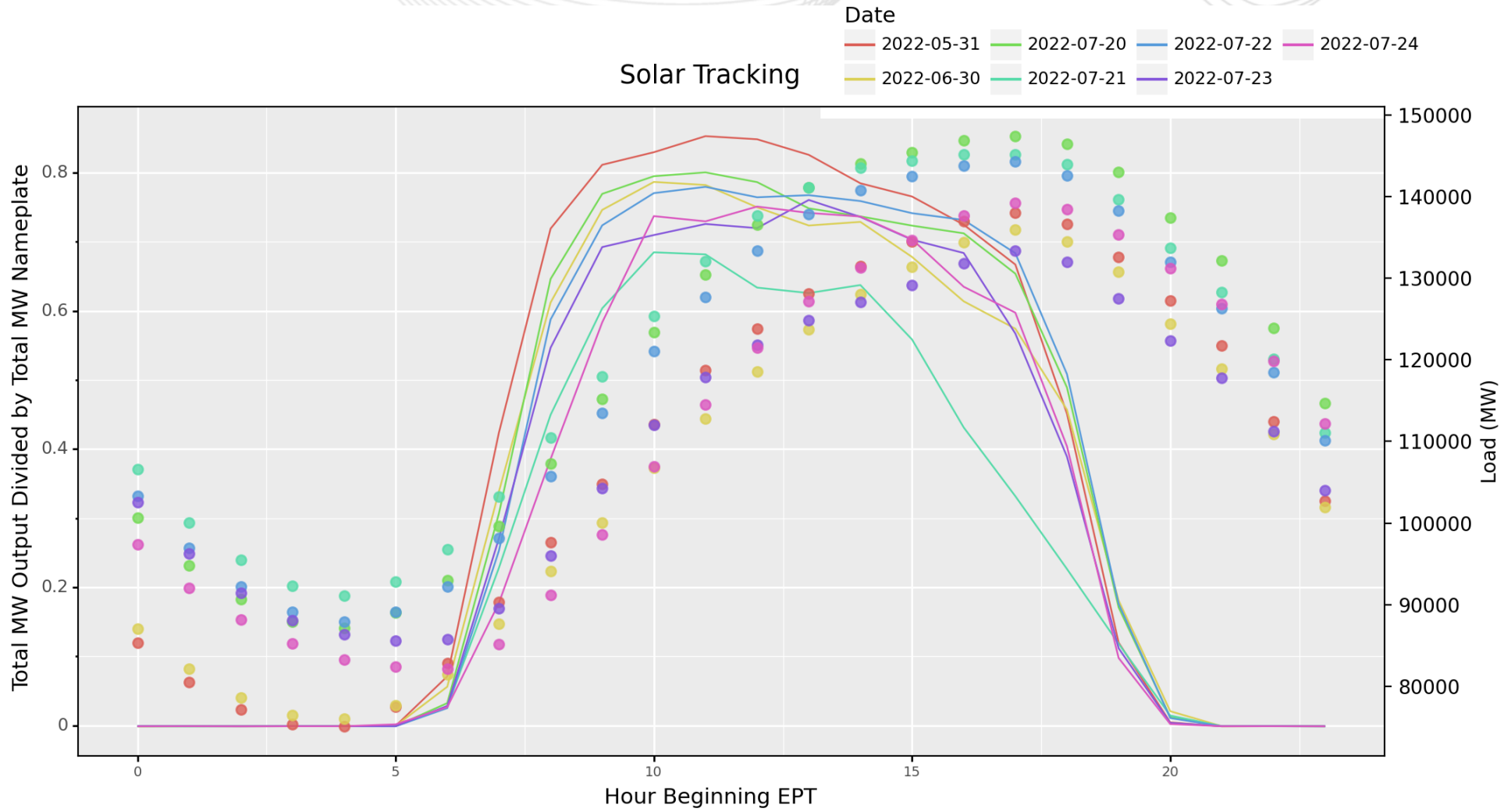


# Solar Fixed Performance during May/June/July/Hot Weather Alerts



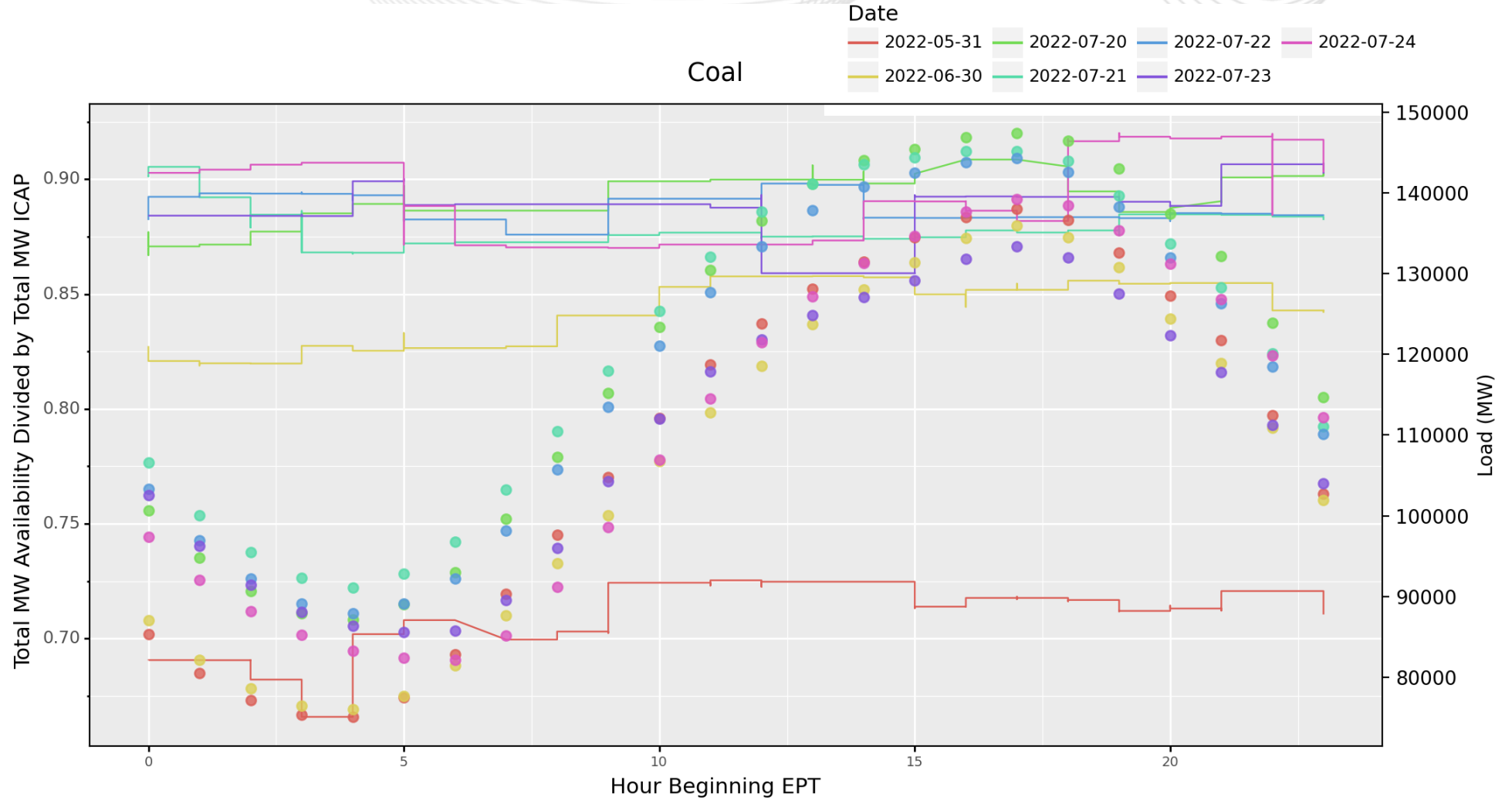


# Solar Tracking Performance during May/June/July/Hot Weather Alerts



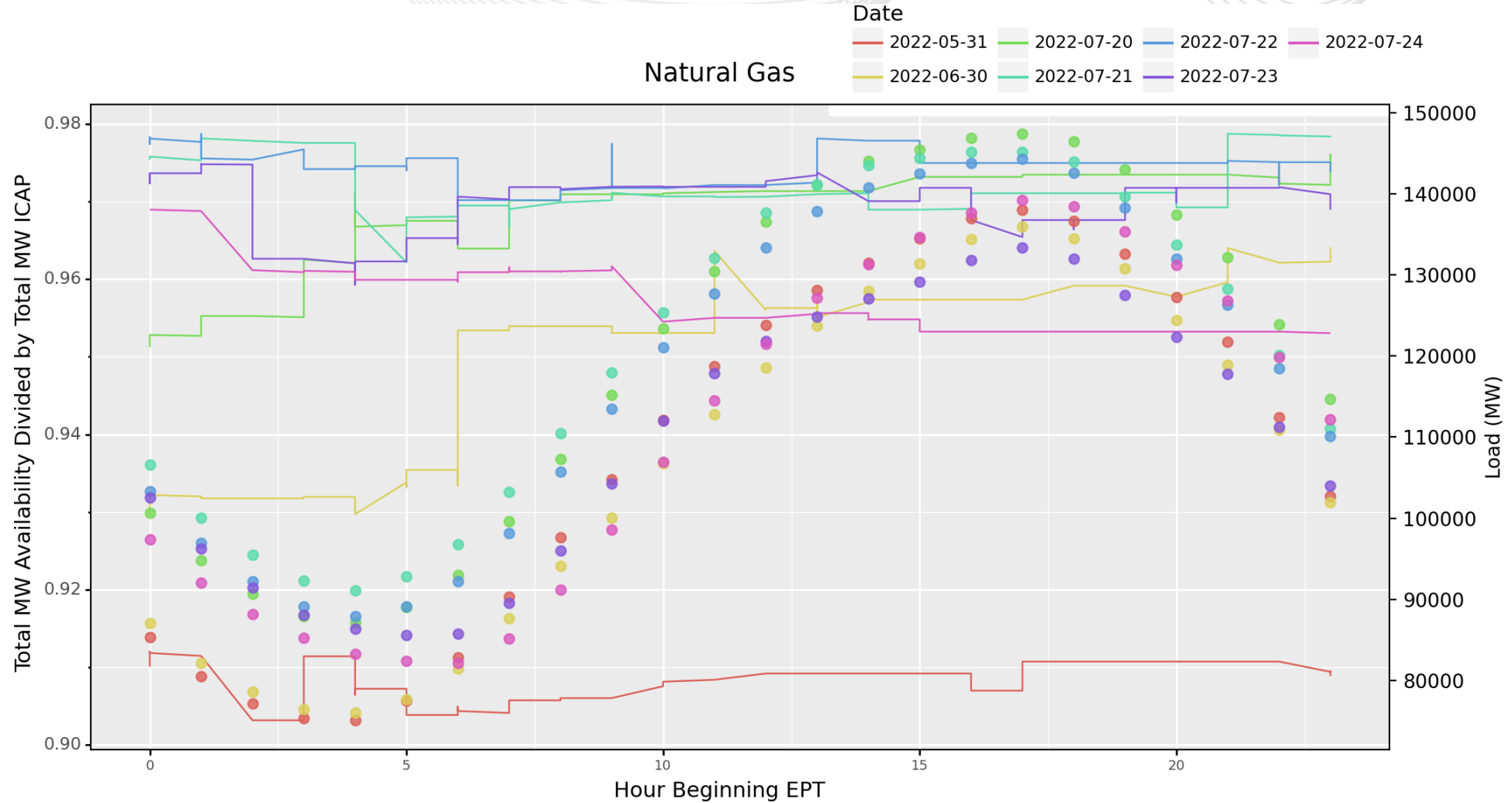


# Coal Availability during May/June/July/Hot Weather Alerts





# Natural Gas Availability during May/June/July/Hot Weather Alerts





# Nuclear Availability during May/June/July/Hot Weather Alerts

Availability was high and very similar during all days.

Graph not provided because of data confidentiality issues.

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**Responses to Follow-Up questions from  
RASTF Data Analysis September  
Presentation**



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