

# BEIJING AIR QUALITY

by dolci sanders and paul torres

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# AFFECTS OF AIR POLLUTION



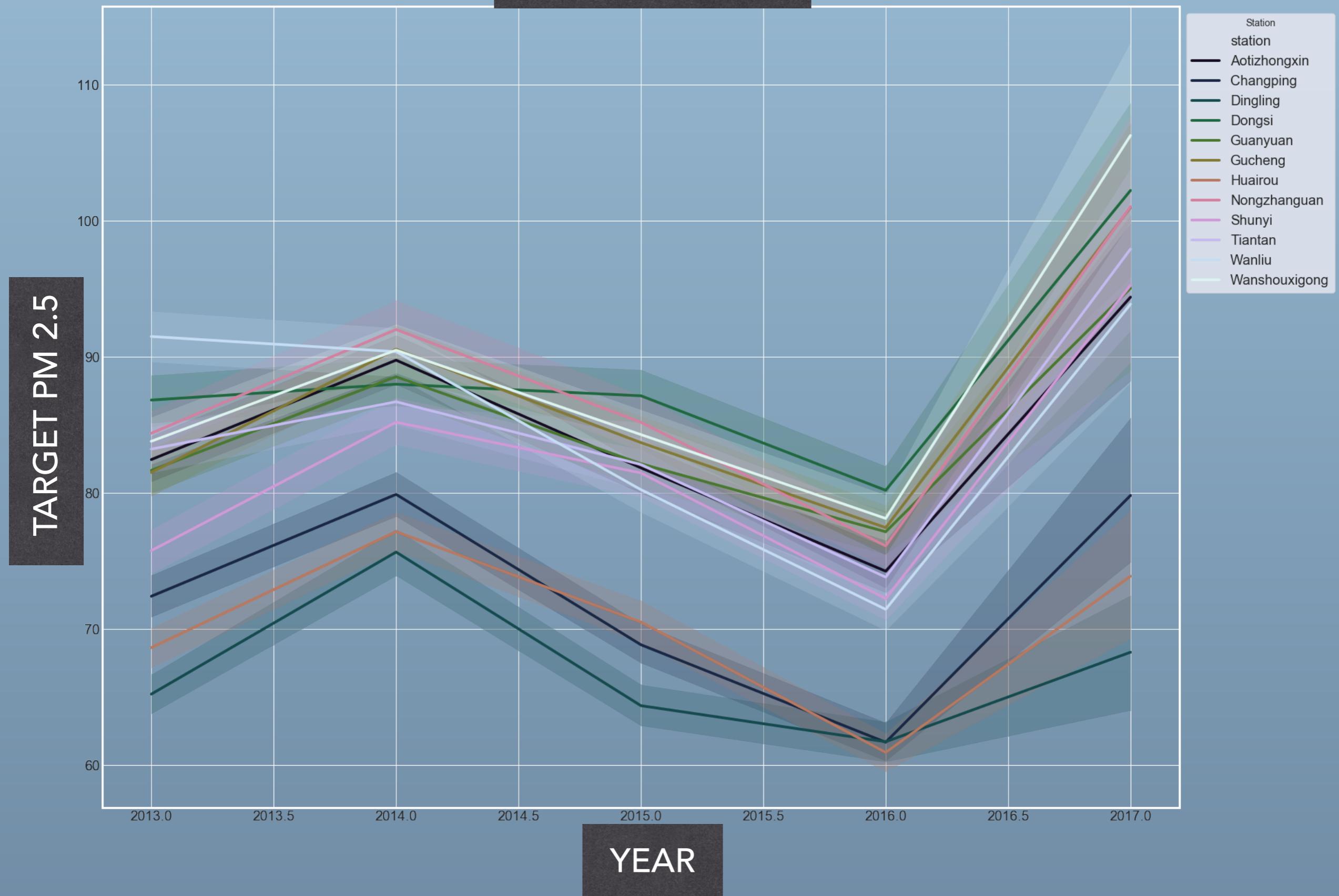
- In 2017, air pollution was responsible for 5 million global deaths.
- In 2018 China, reported 1.1 million premature deaths linked to the air pollution problem
- 20 million tonnes of failed crops in 2018

OUR DATA IS  
PROVIDED BY  
UCI MACHINE  
LEARNING  
LIBRARY:

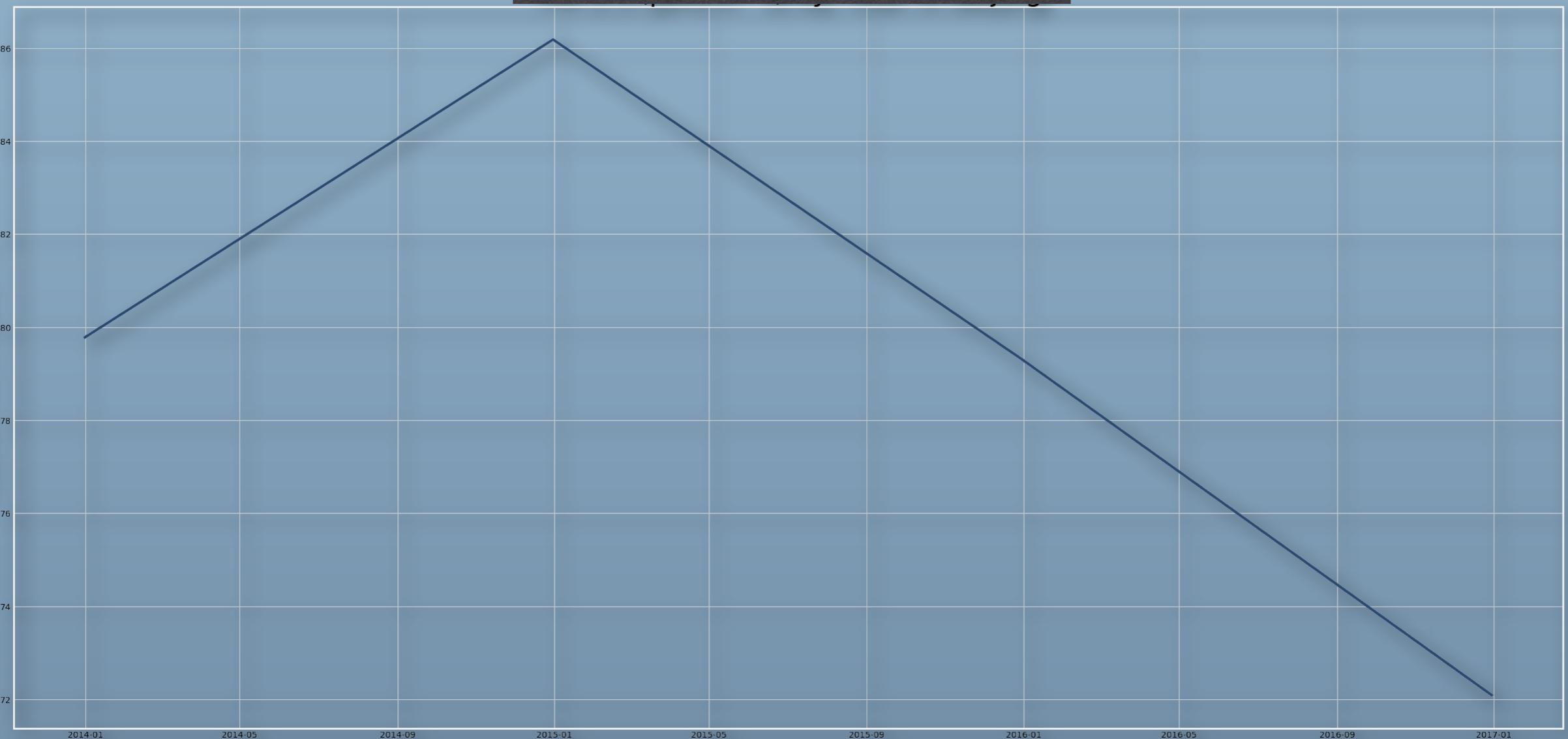
BEIJING MULTI  
SITE AIR  
QUALITY DATA  
SET



## PM 2.5 by YEAR



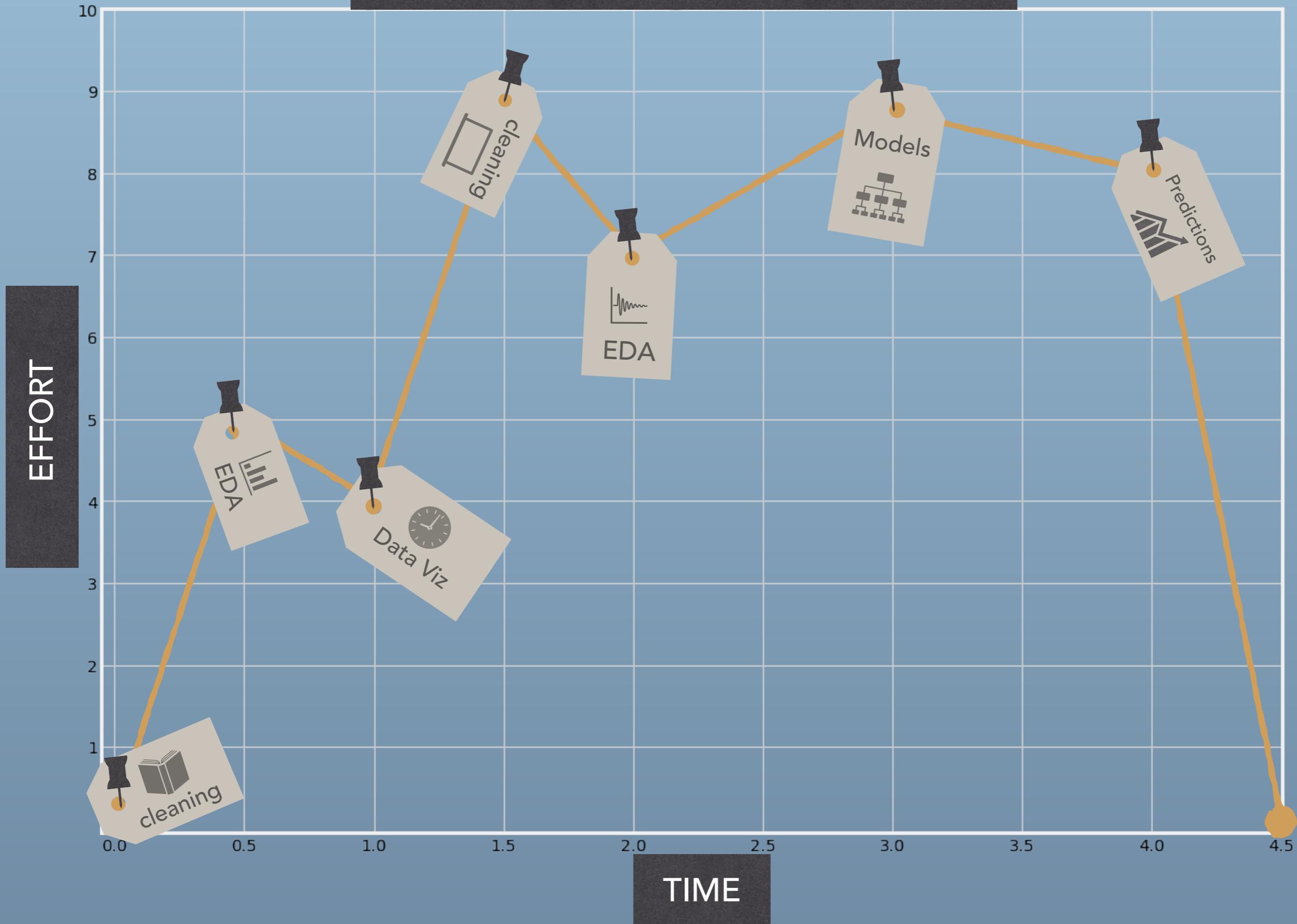
TARGET PM 2.5

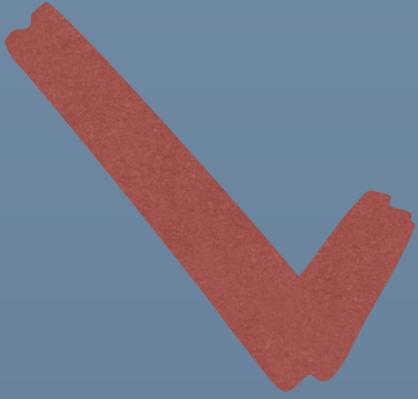


YEAR

PM 2.5 by YEAR

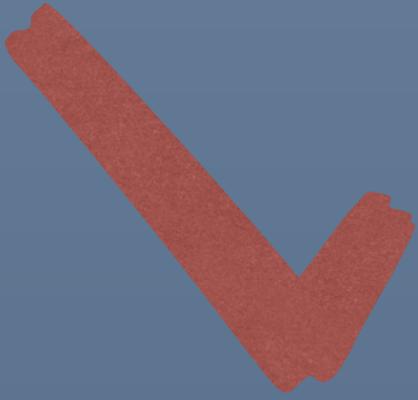
# JOURNEY THROUGH TIME SERIES





CHECKING FOR  
NAN VALUES

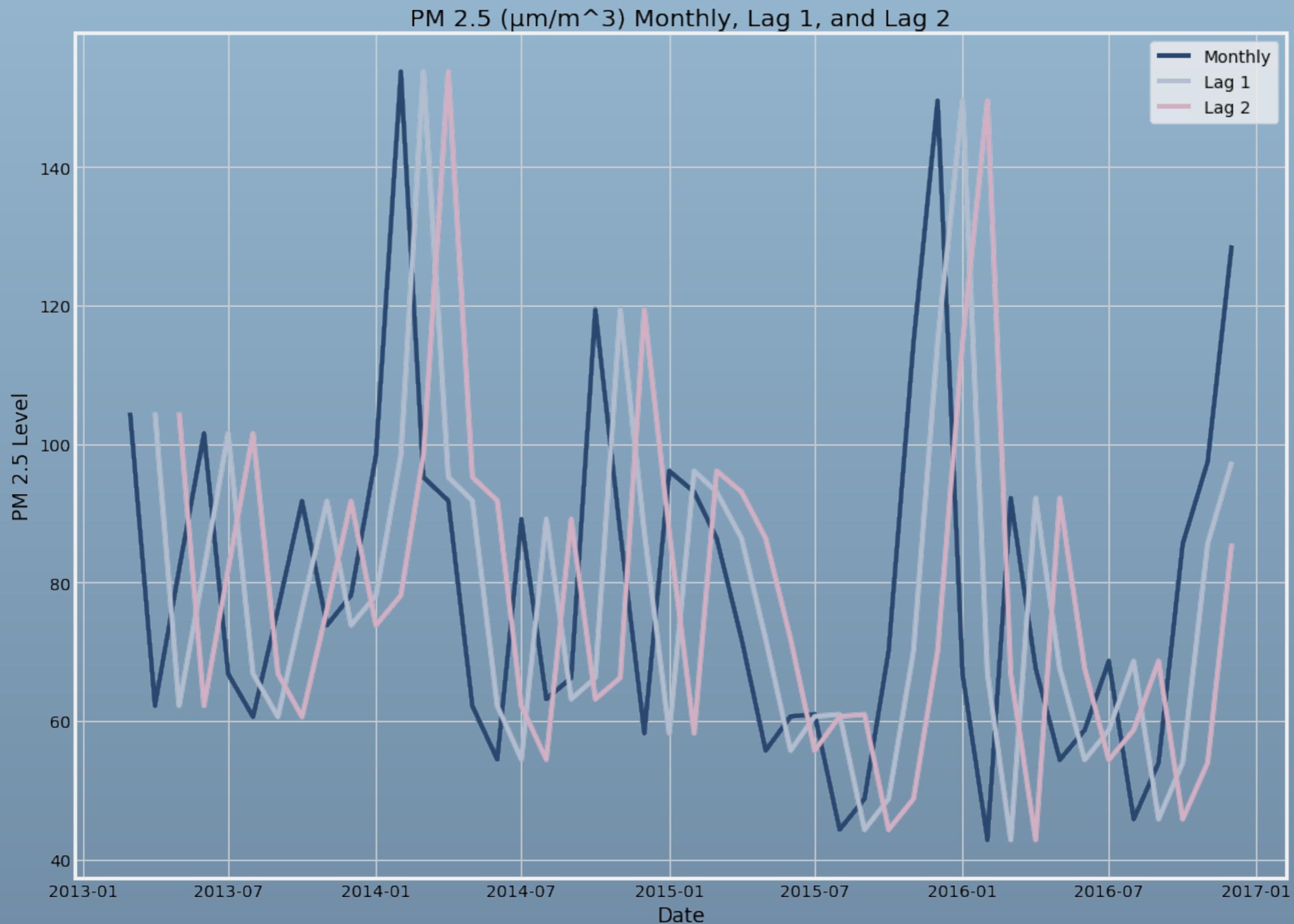
INTERPOLATION METHOD = TIME



STATIONARITY

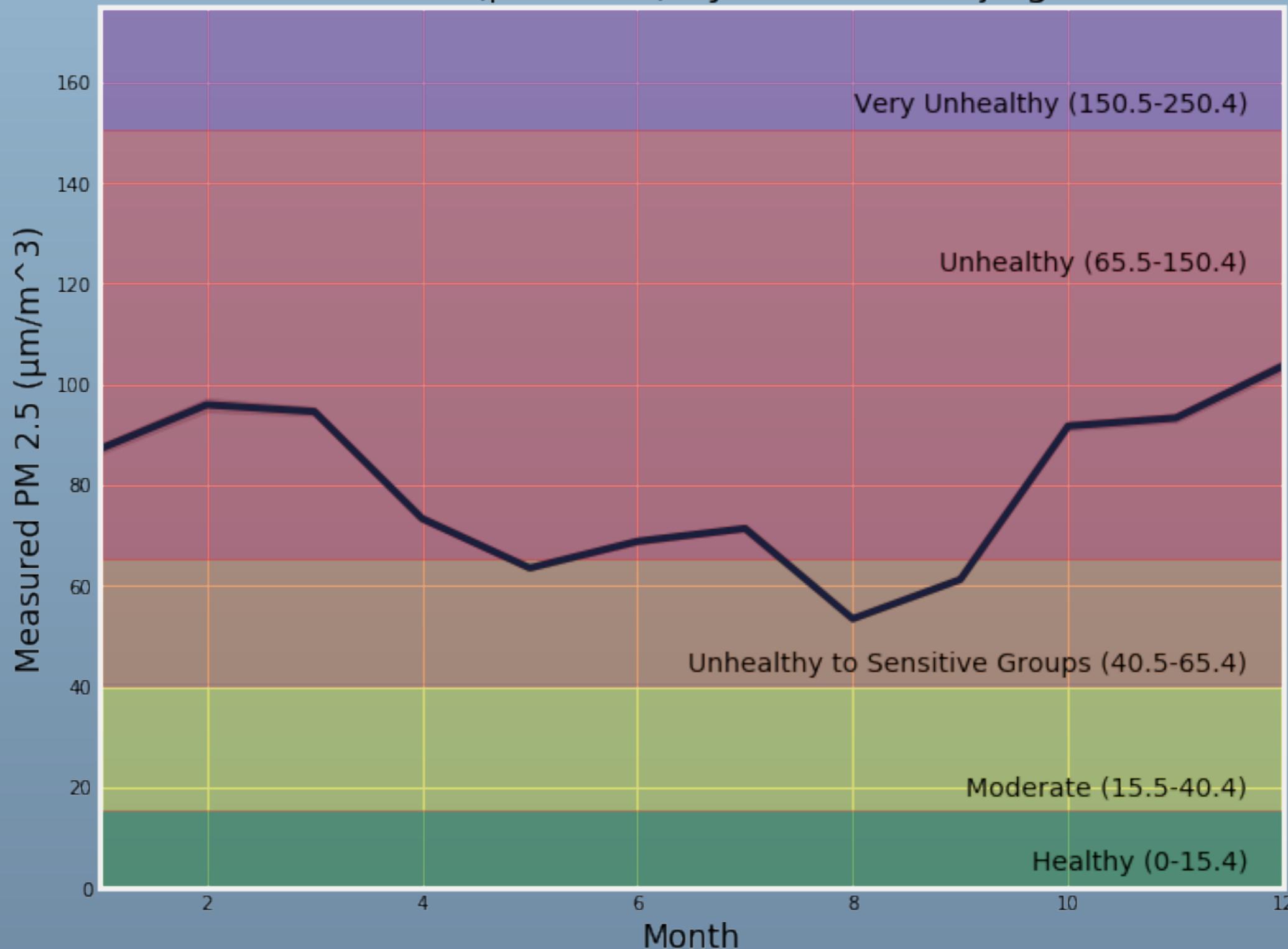
DICKEY FULLER TEST  
NP.LOG for Daily

# IS IT STATIONARY?



# VISUALIZING BEIJING'S AIR QUALITY PROBLEMS

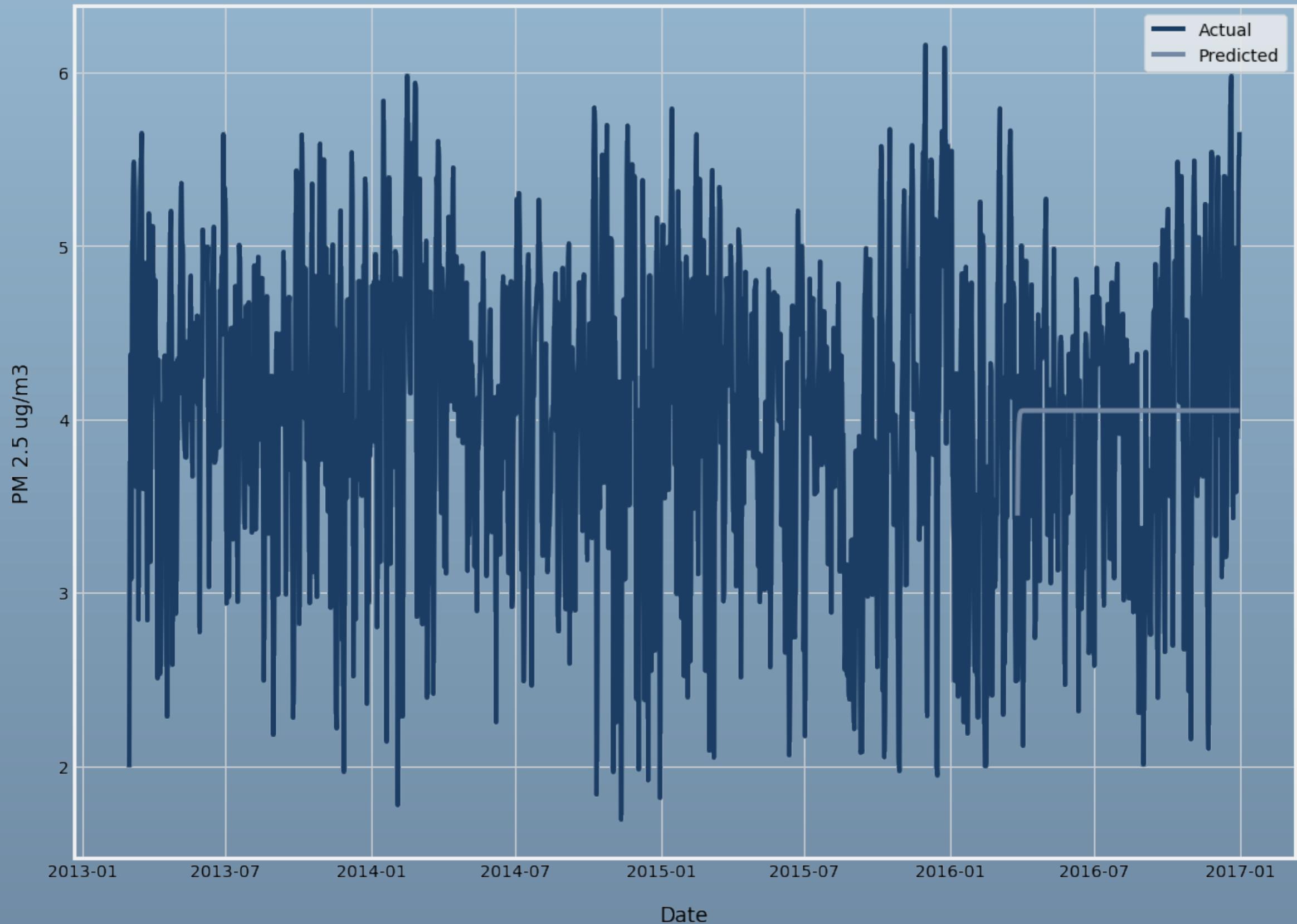
PM 2.5 ( $\mu\text{m}/\text{m}^3$ ) by Month in Beijing



# MODELS

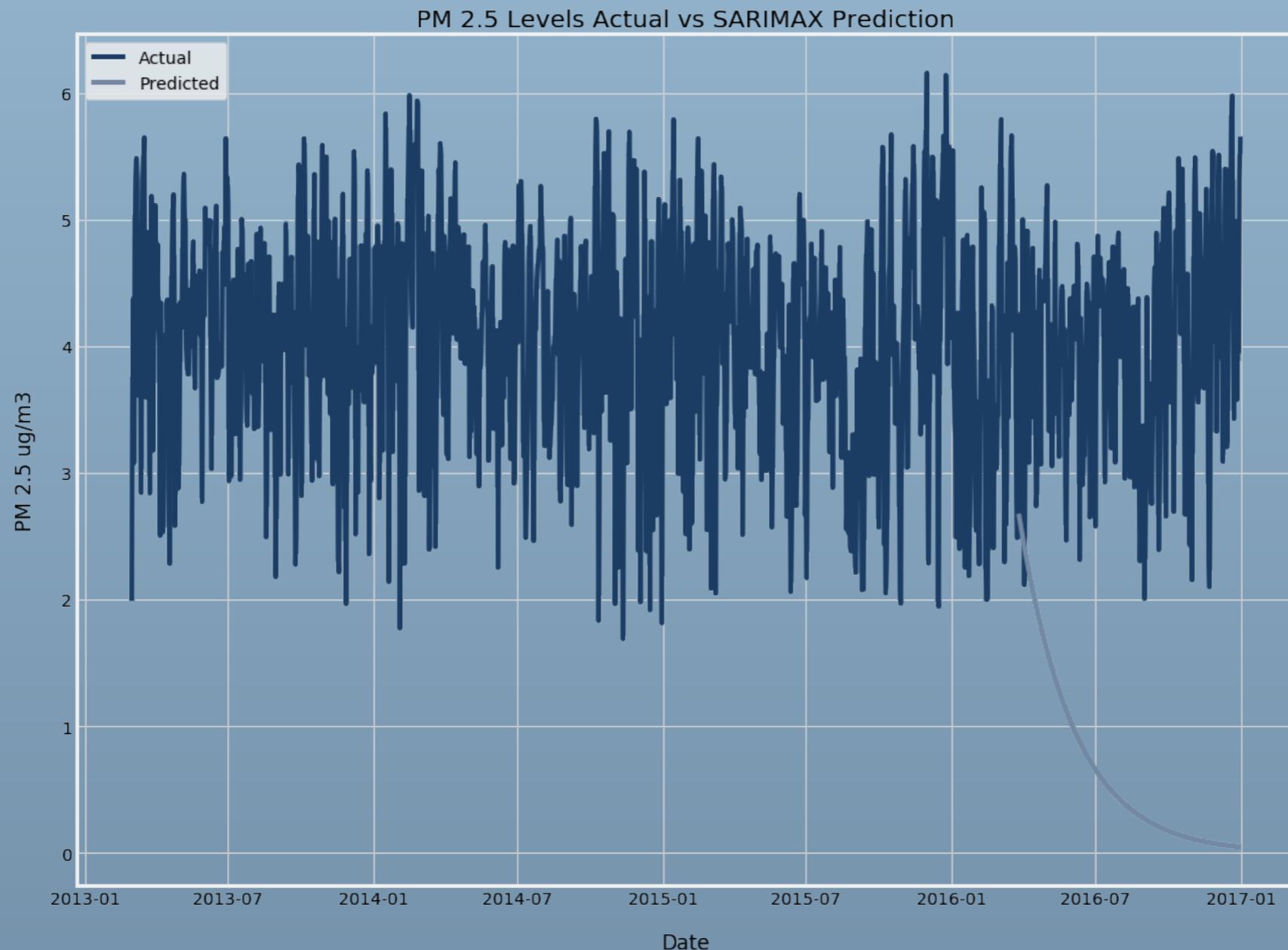
# ARIMA

PM 2.5 Levels Actual vs ARIMA Prediction



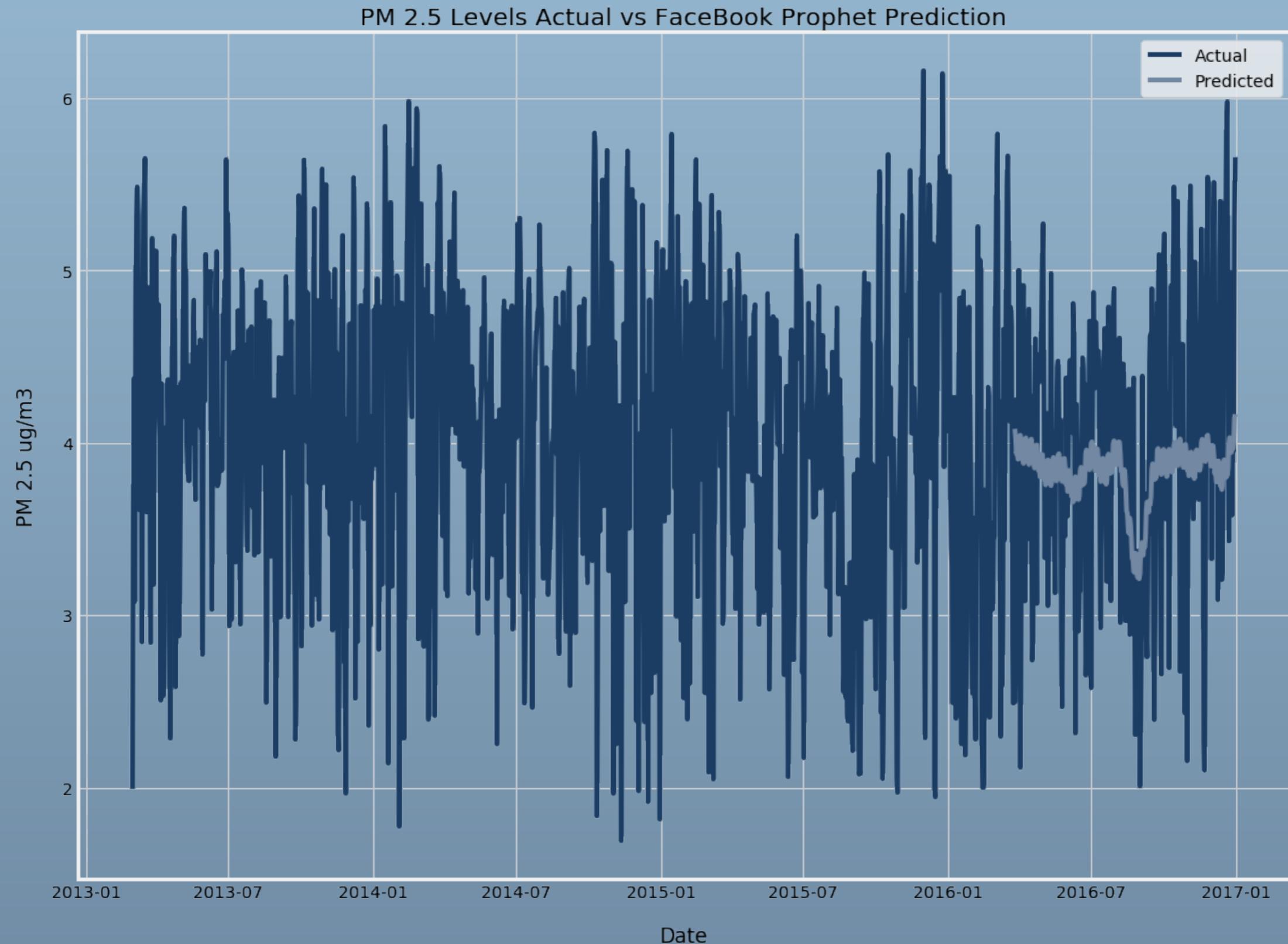
# SARIMAX

SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE WITH EXOGENOUS REGRESSORS MODEL

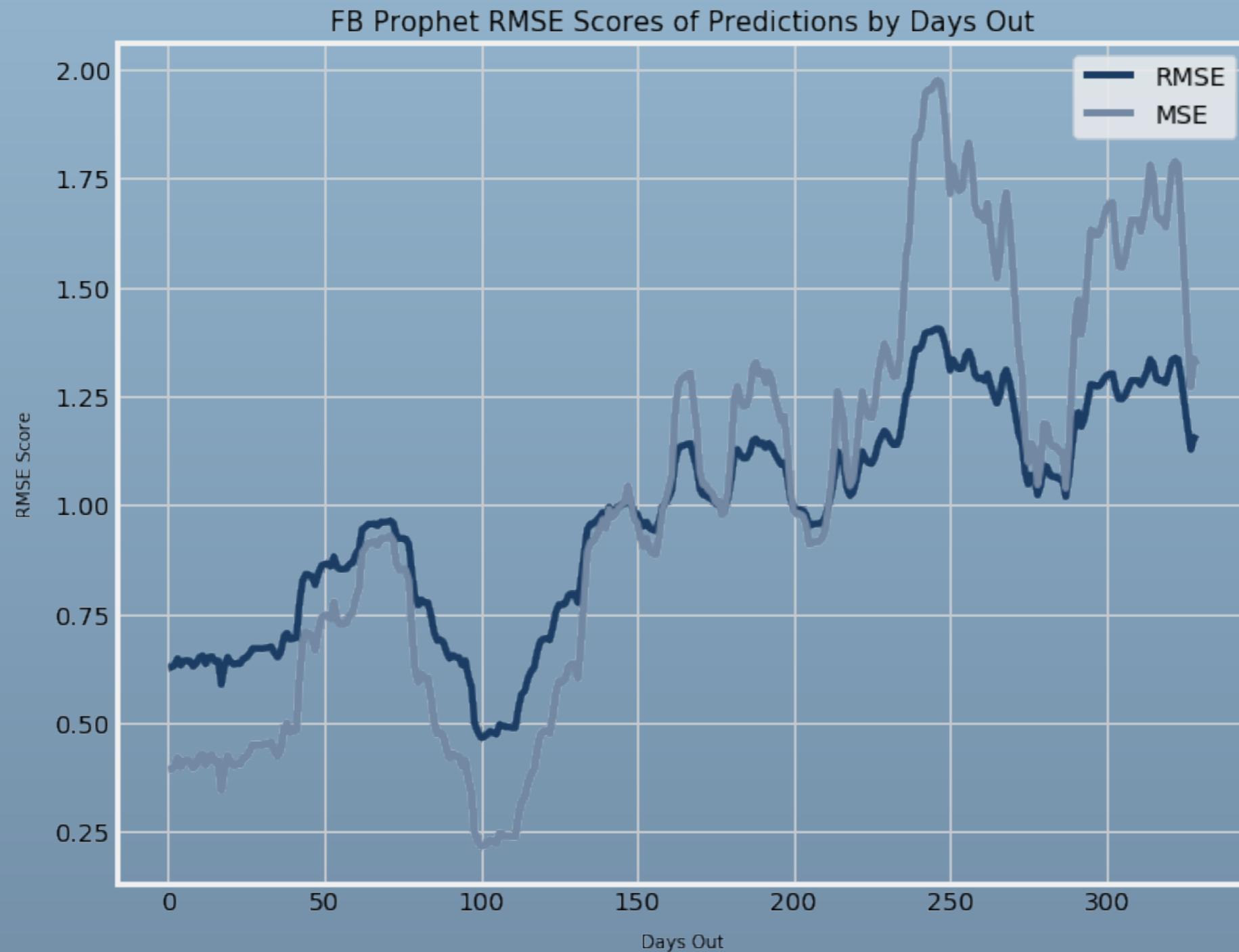


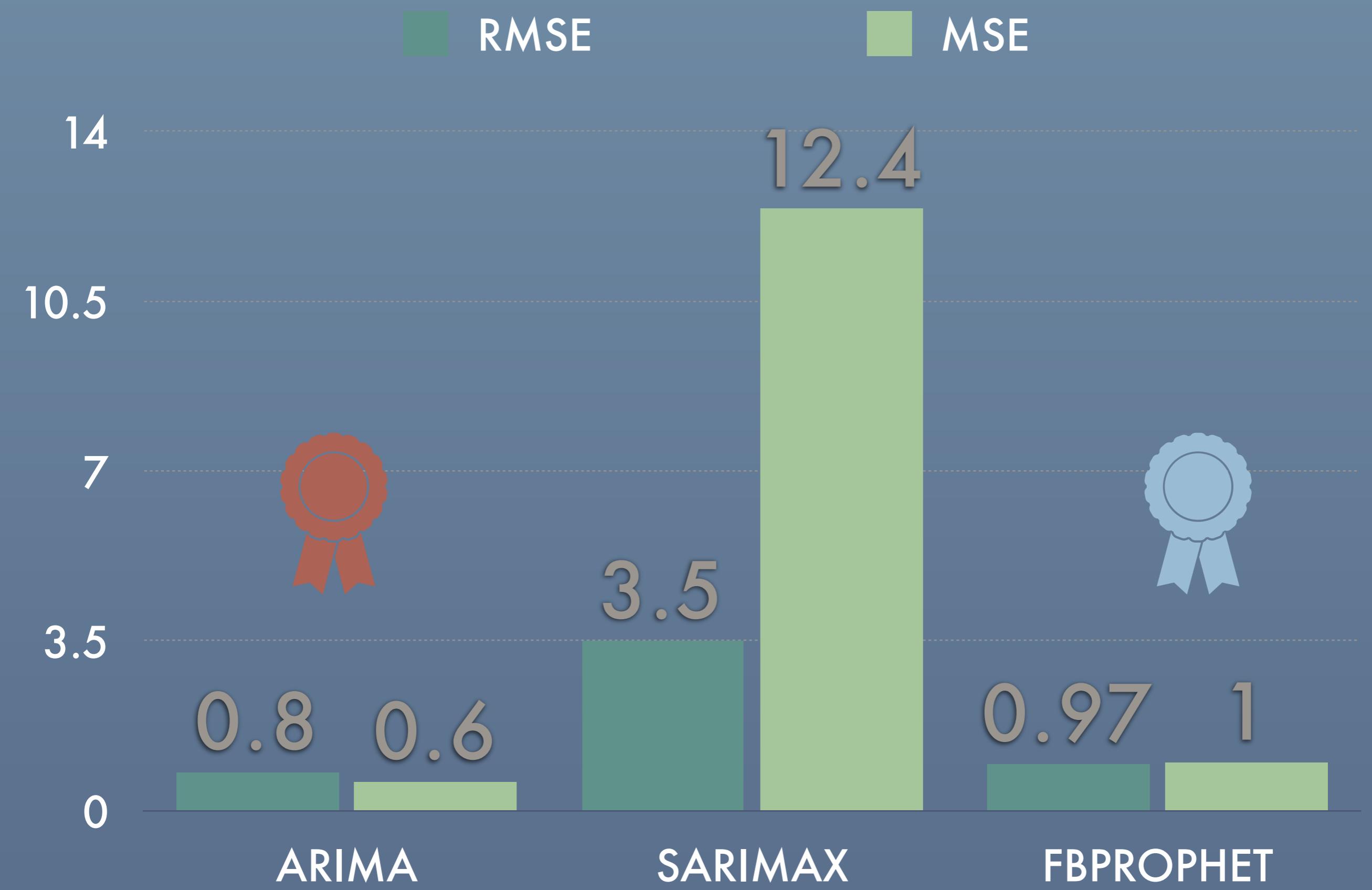
WOULD LIKELY HAVE BEEN BETTER FOR A  
MULTIVARIATE APPROACH.

# FACEBOOK PROPHET



# FACEBOOK PROPHET





# THERE IS HOPE

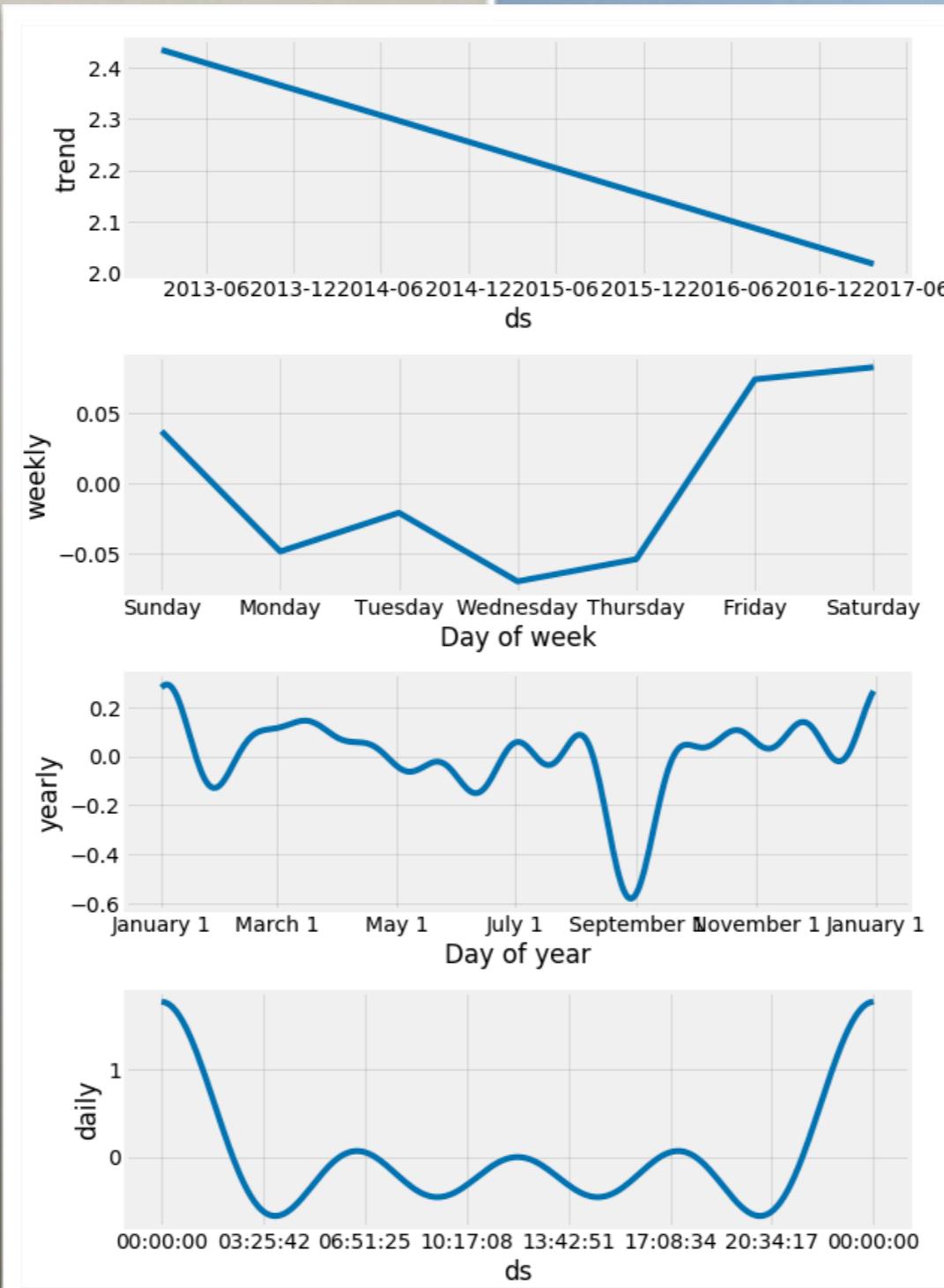


Image Ohio State

# FURTHER STEPS

- EXPAND USE OF FACEBOOK PROPHET'S FEATURES
- INTRODUCE RNN AND LTSM AS MODELS TO ENHANCE PREDICTIVE POWERS

# RECOMMENDATIONS FOR SUCCESS

- INCREASING TRANSPARENCY OF TESTING SITE
- KEEPING RESIDENTS INFORMED ON PROGRESS SHOWING AIR QUALITY IS A VIABLE SHORT TERM GOAL
- PUBLIC HEALTH CAMPAIGNS TO ENCOURAGE LESS USAGE OF TRANSPORTATION THAT RELIES ON FOSSIL FUELS
- AFFORDABLE PUBLIC TRANSPORTATION OPTIONS THAT RUN ON CLEAN ENERGY
- USING THE DATA PROVIDED BY THE SITES TO TRACK INCREASES IN SMOG CAUSING POLLUTANTS WOULD HELPING ENVIRONMENTALISTS RECOGNIZE INCREASING POLLUTION TRENDS AND RESOLVING PROBLEMS QUICKLY.

# SOURCES

SOUTH CHINA MORNING POST

UCI MACHINE LEARNING LIBRARY

OUR WORLD IN DATA