

BEIJING AIR QUALITY

by dolci sanders and paul torres

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AFFECTS OF AIR POLLUTION



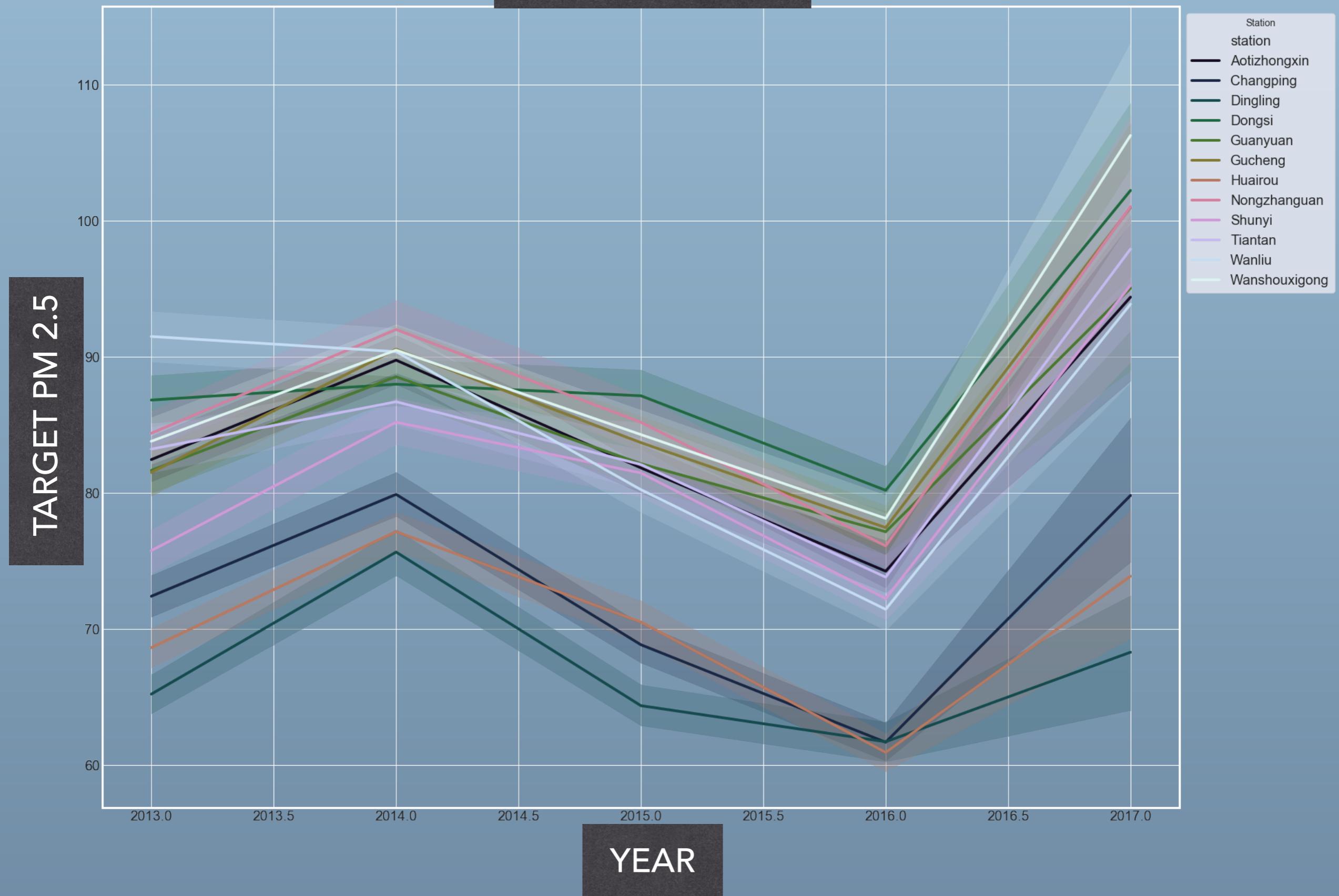
- In 2017, air pollution was responsible for 5 million global deaths.
- In 2018 China, reported 1.1 million premature deaths linked to the air pollution problem
- 20 million tonnes of failed crops in 2018

OUR DATA IS
PROVIDED BY
UCI MACHINE
LEARNING
LIBRARY:

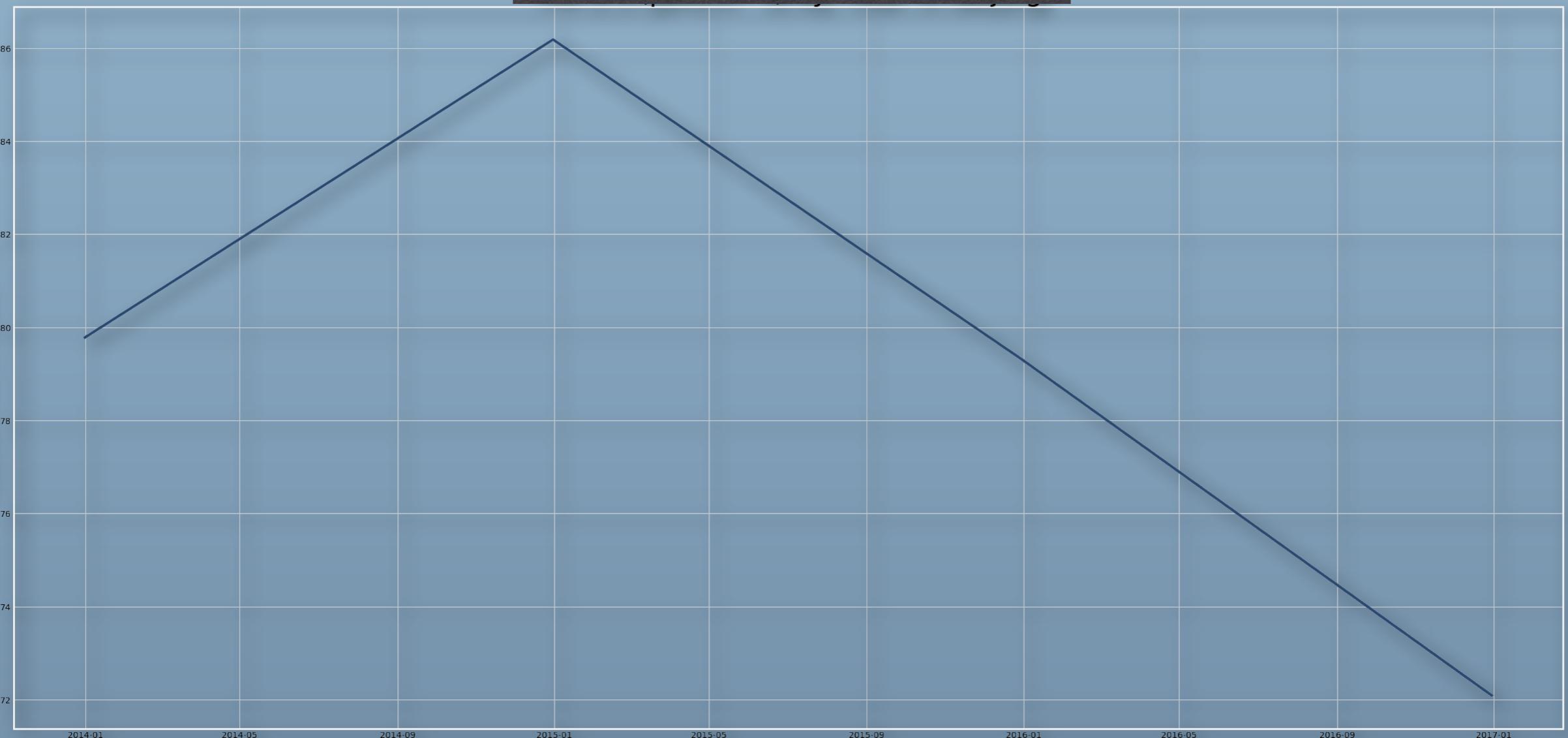
BEIJING MULTI
SITE AIR
QUALITY DATA
SET



PM 2.5 by YEAR



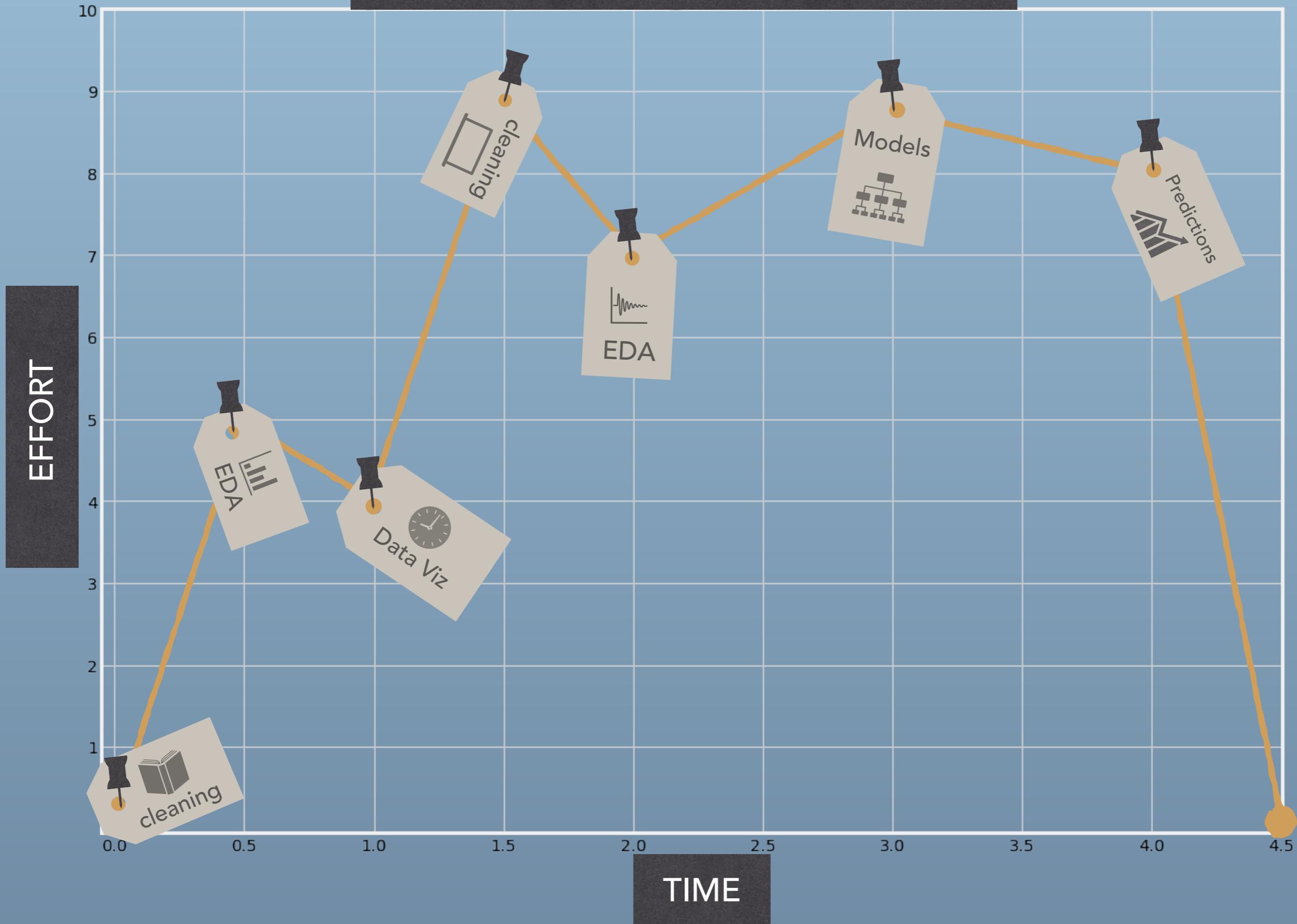
TARGET PM 2.5

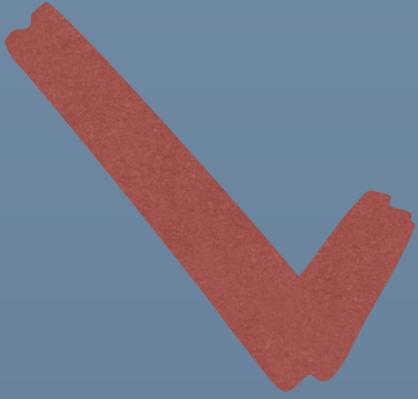


YEAR

PM 2.5 by YEAR

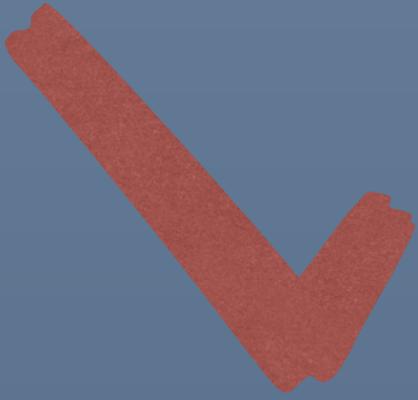
JOURNEY THROUGH TIME SERIES





CHECKING FOR
NAN VALUES

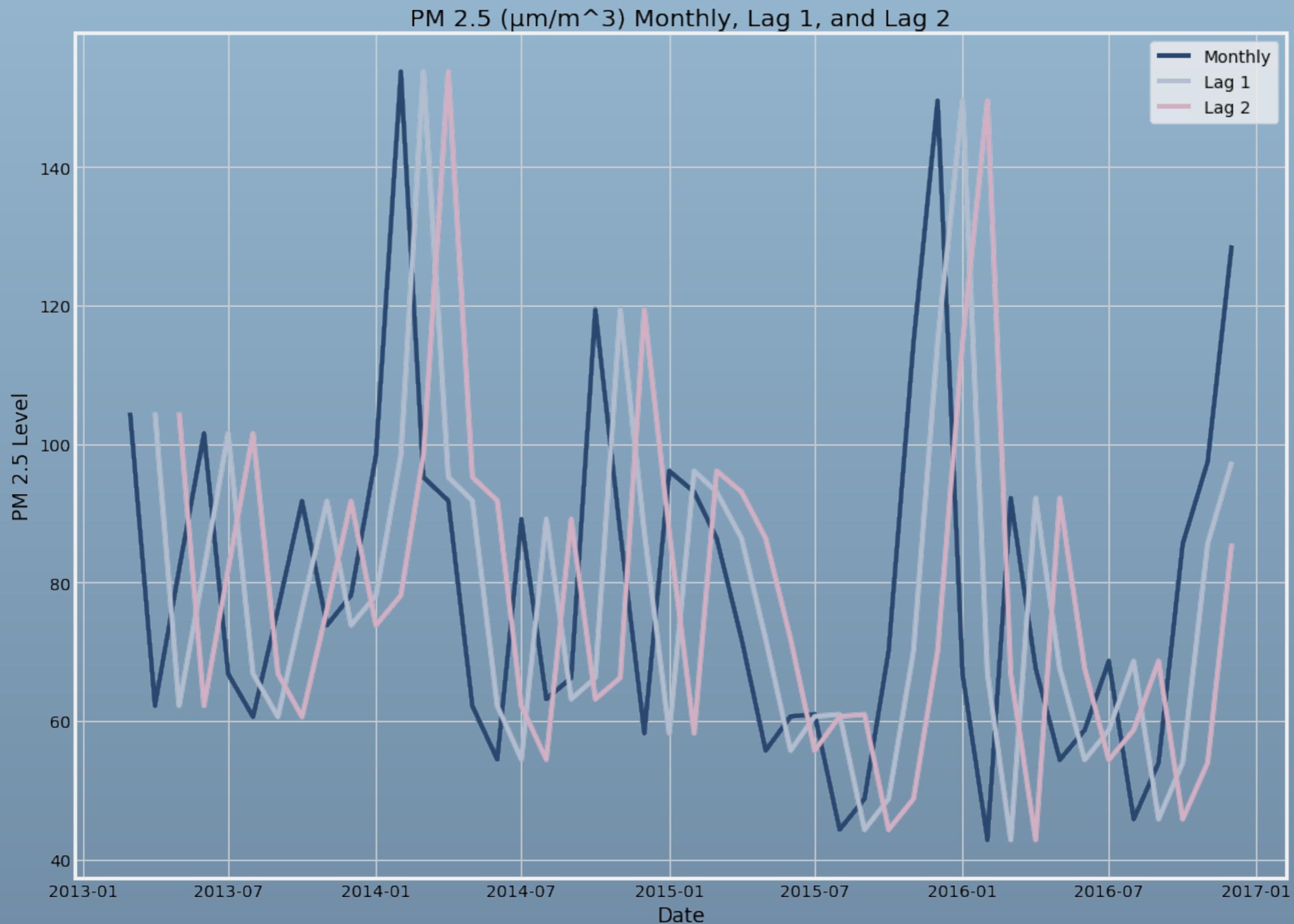
INTERPOLATION METHOD = TIME



STATIONARITY

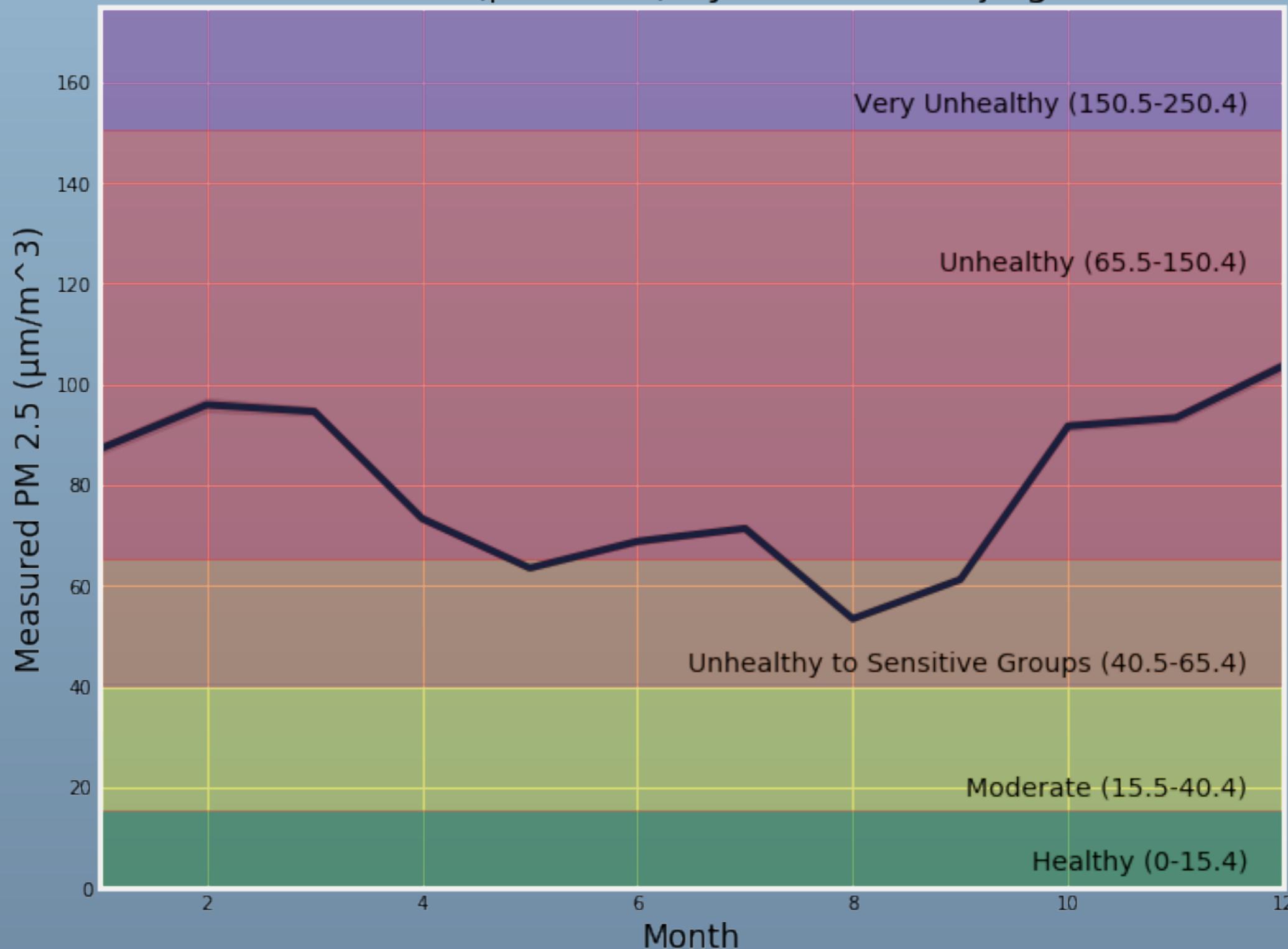
DICKEY FULLER TEST
NP.LOG for Daily

IS IT STATIONARY?



VISUALIZING BEIJING'S AIR QUALITY PROBLEMS

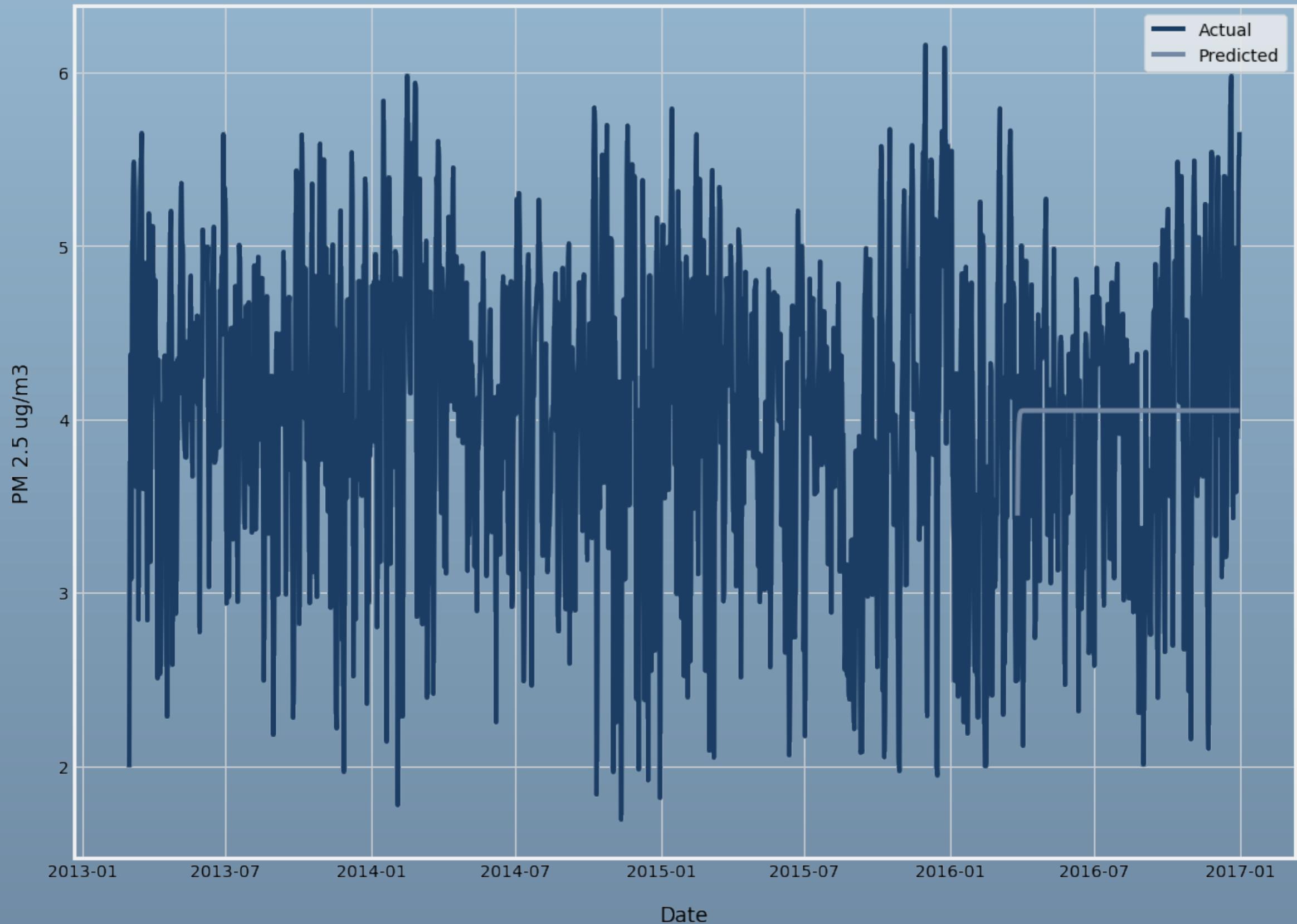
PM 2.5 ($\mu\text{m}/\text{m}^3$) by Month in Beijing



MODELS

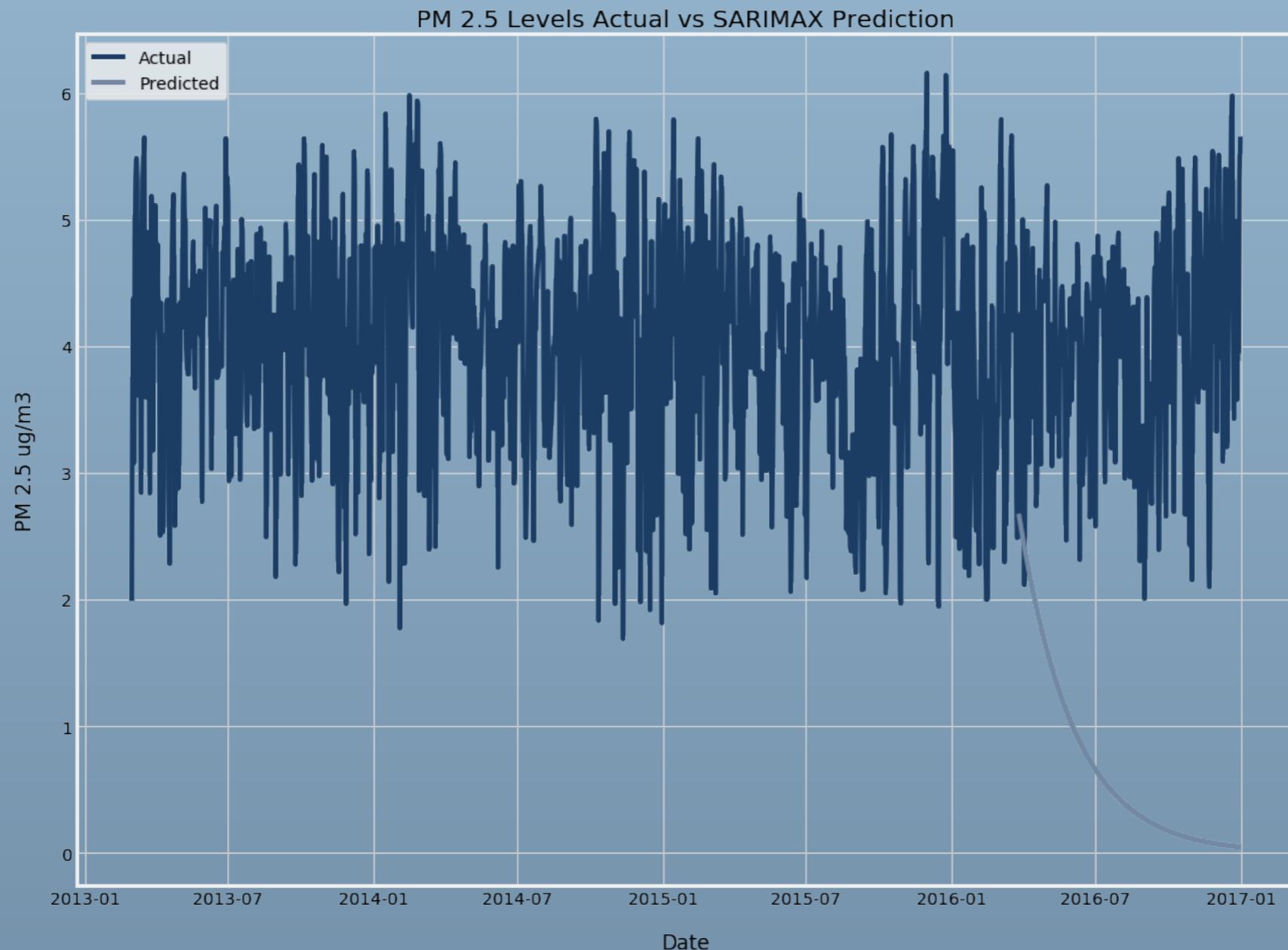
ARIMA

PM 2.5 Levels Actual vs ARIMA Prediction



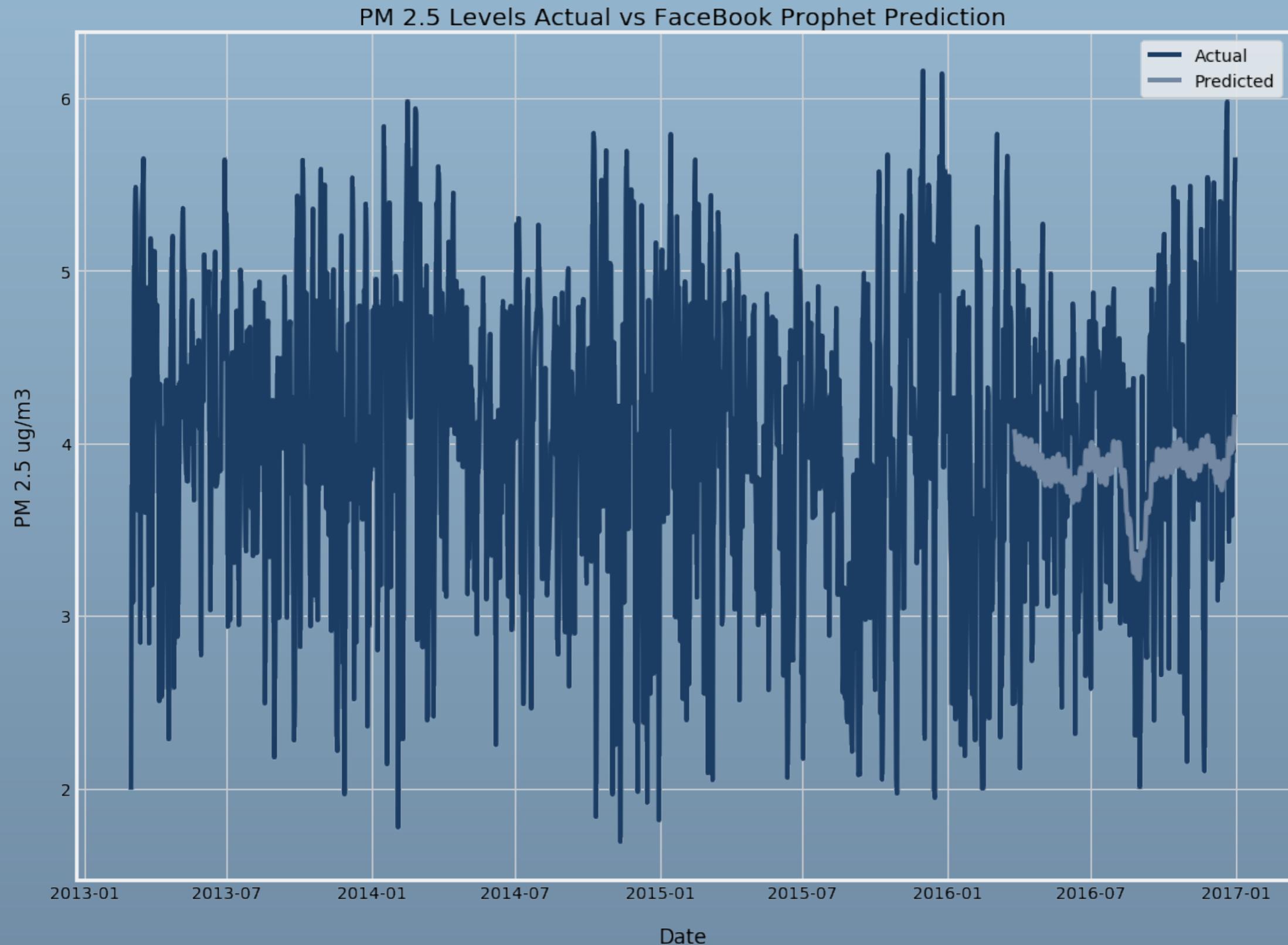
SARIMAX

SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE WITH EXOGENOUS REGRESSORS MODEL

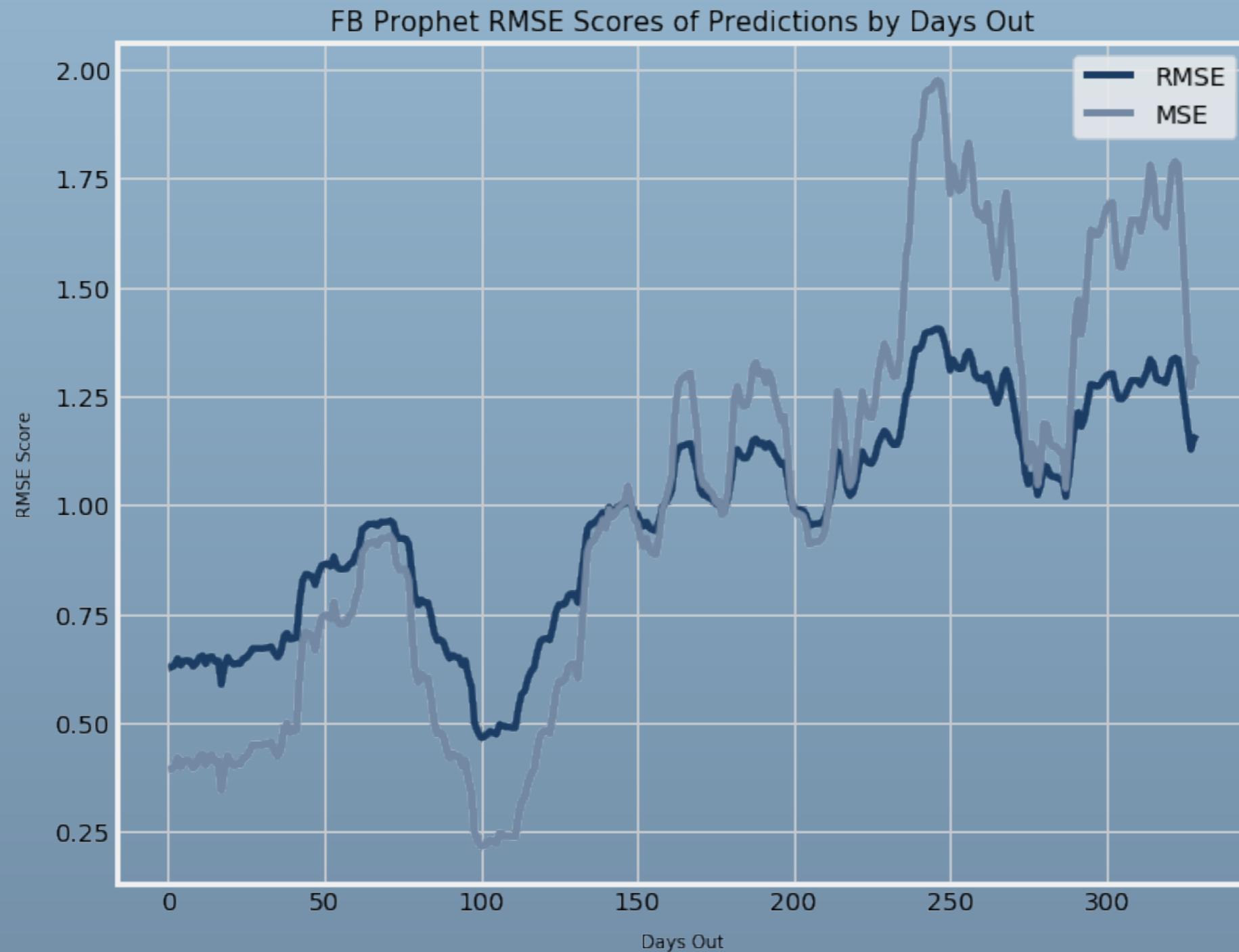


WOULD LIKELY HAVE BEEN BETTER FOR A
MULTIVARIATE APPROACH.

FACEBOOK PROPHET



FACEBOOK PROPHET





RMSE



MSE

14

10.5

7

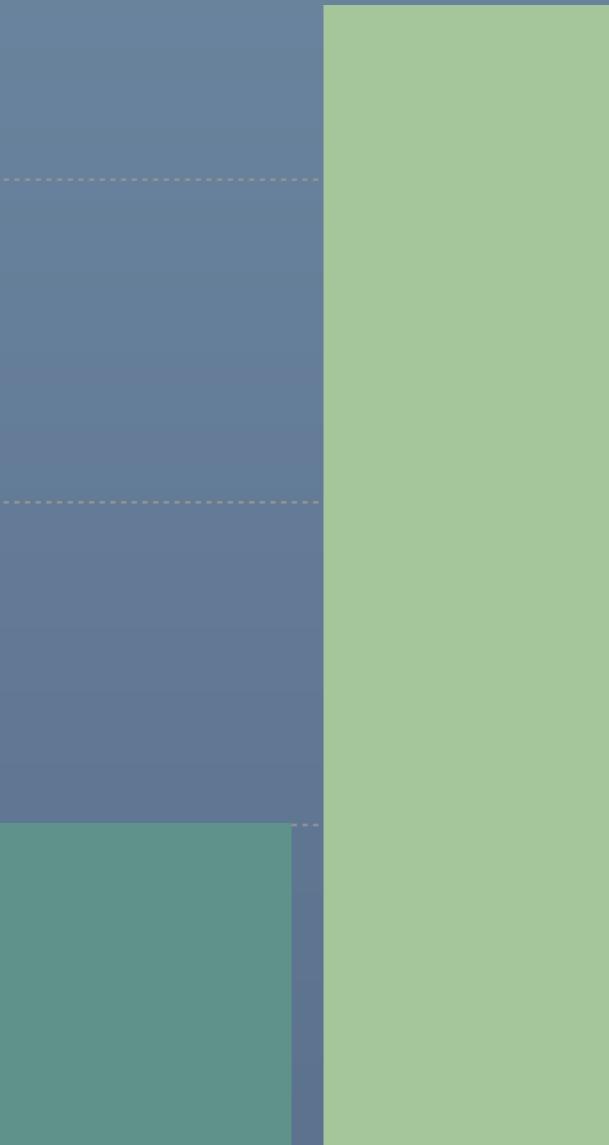
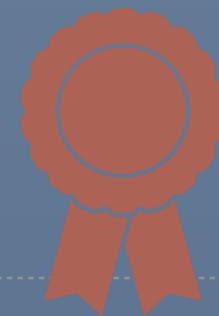
3.5

0

ARIMA

SARIMAX

FBPROPHET



THERE IS HOPE

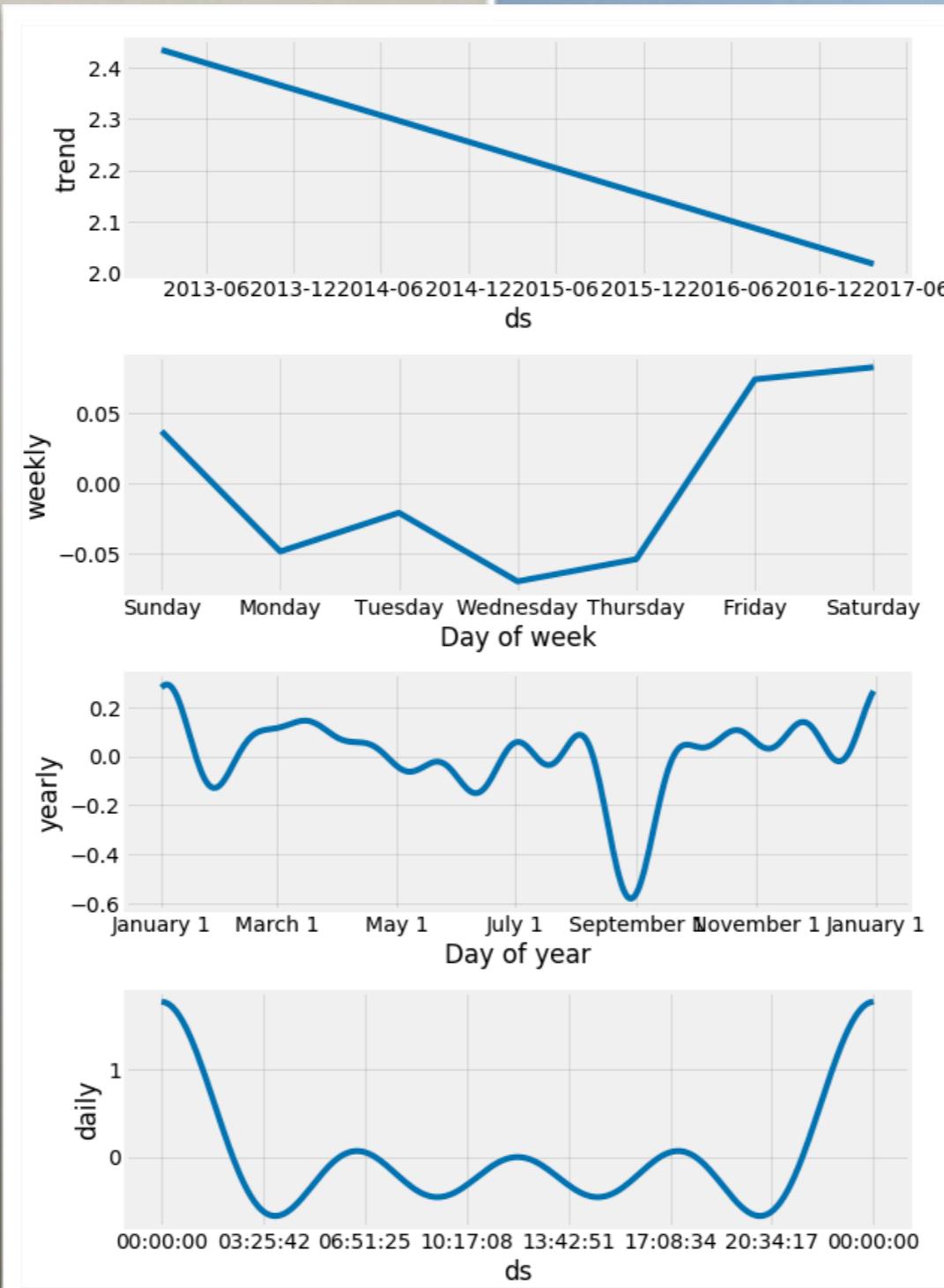


Image Ohio State

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