

PREDICTING DISSOLVED OXYGEN LEVELS IN STREAMS

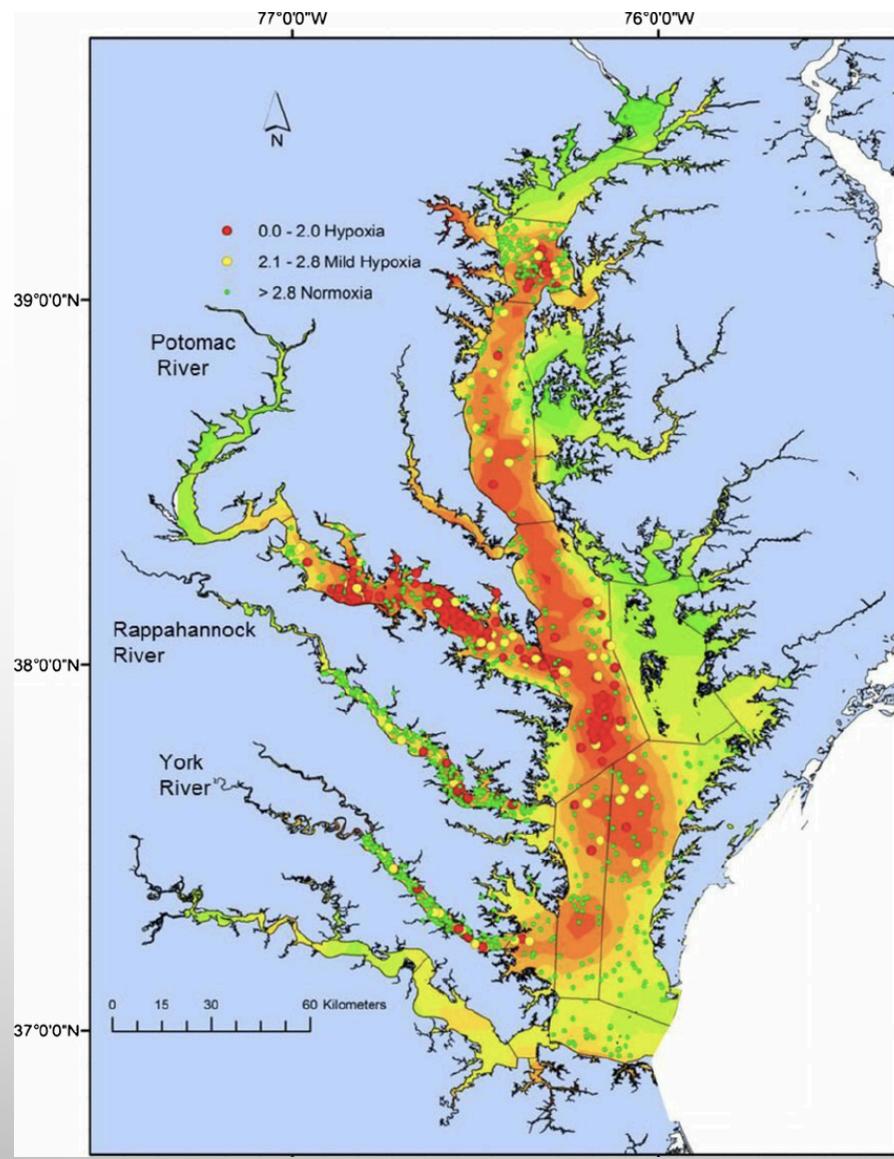
MAURIE KATHAN
DATA SCIENTIST

DISSOLVED OXYGEN

- Dissolved Oxygen is one of many common indicators tested to identify stream health.
 - Others include water temperature, PH and clarity
- We use dissolved Oxygen because the levels of oxygen in a stream, lake or bay is very important to the health of the organizations that live within the water. When oxygen levels get too low or two high this can be lethal to fish and micro-organisms.



Eutrophic stream in China



LETORT SPRING RUN

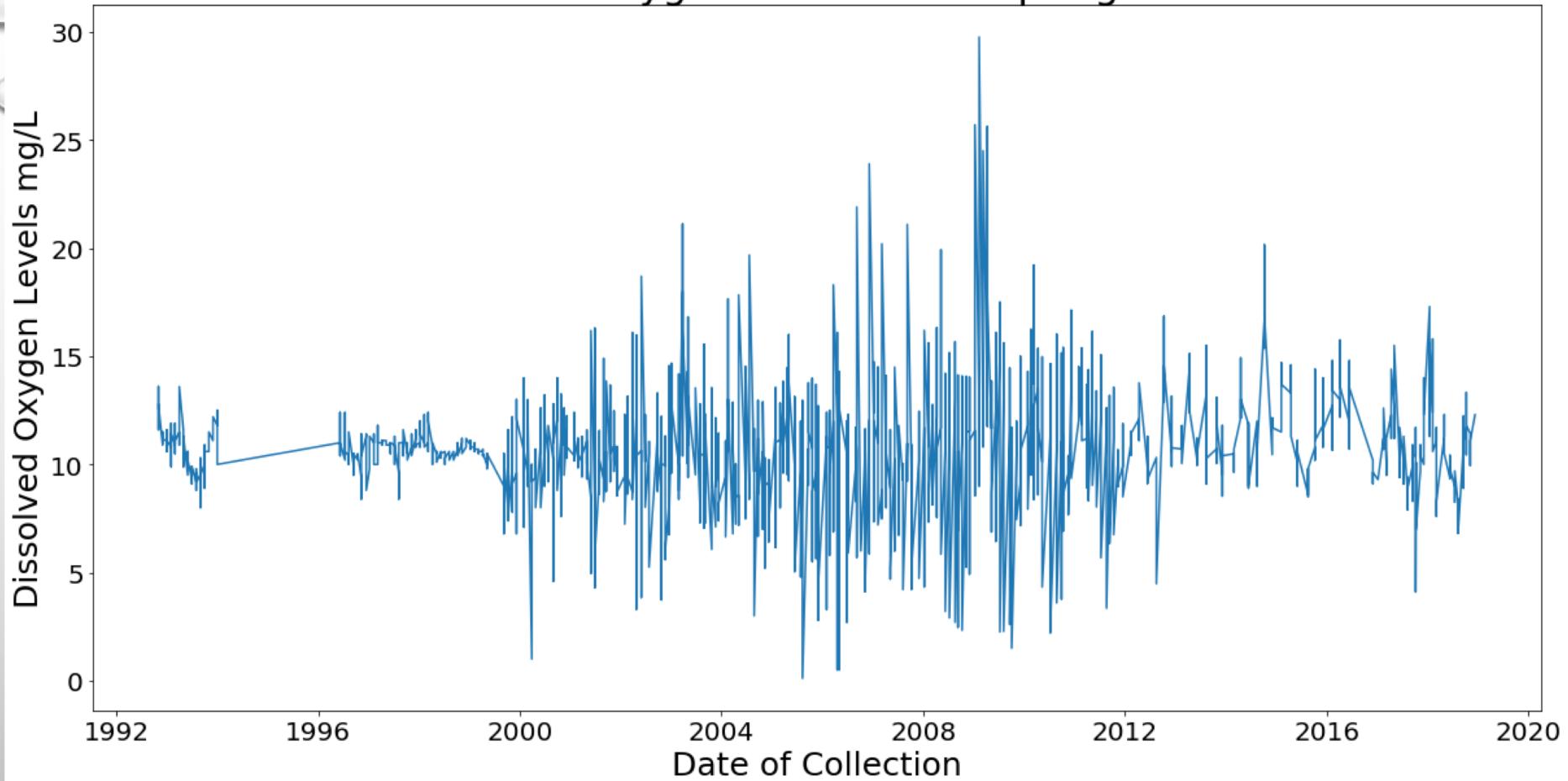




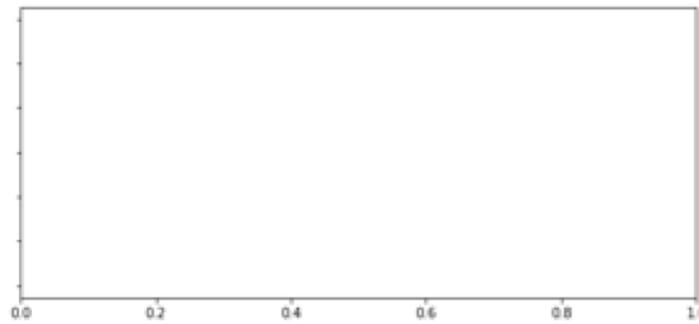
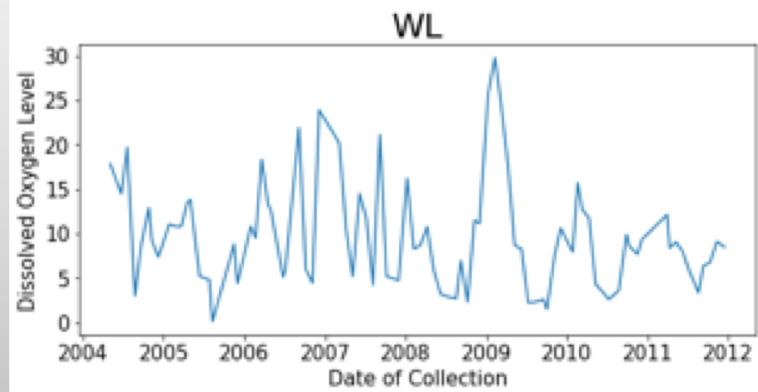
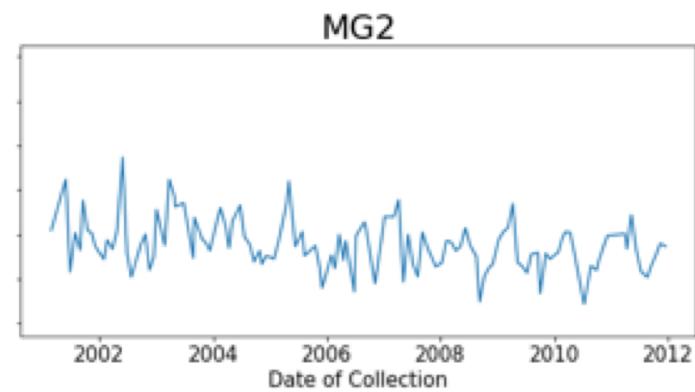
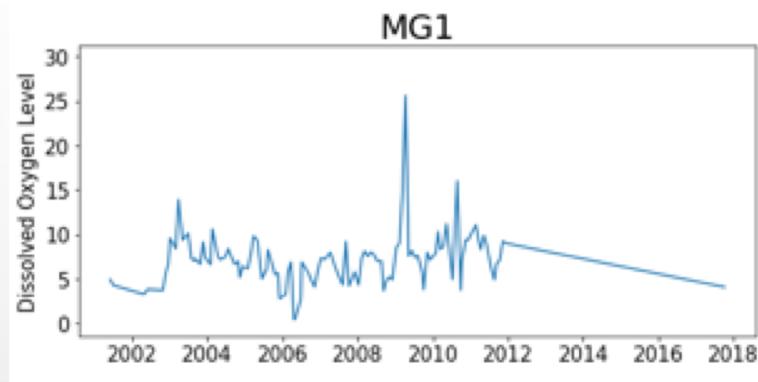
The Letort Regional Authority has been collecting data at 13 sites along the Letort Spring Run outside of Carlisle Pennsylvania since 1992.



Collected Dissolved Oxygen Level Letort Spring Run 1992 -2018



Outlier Collection Sites



BUILDING THE TIME SERIES MODEL

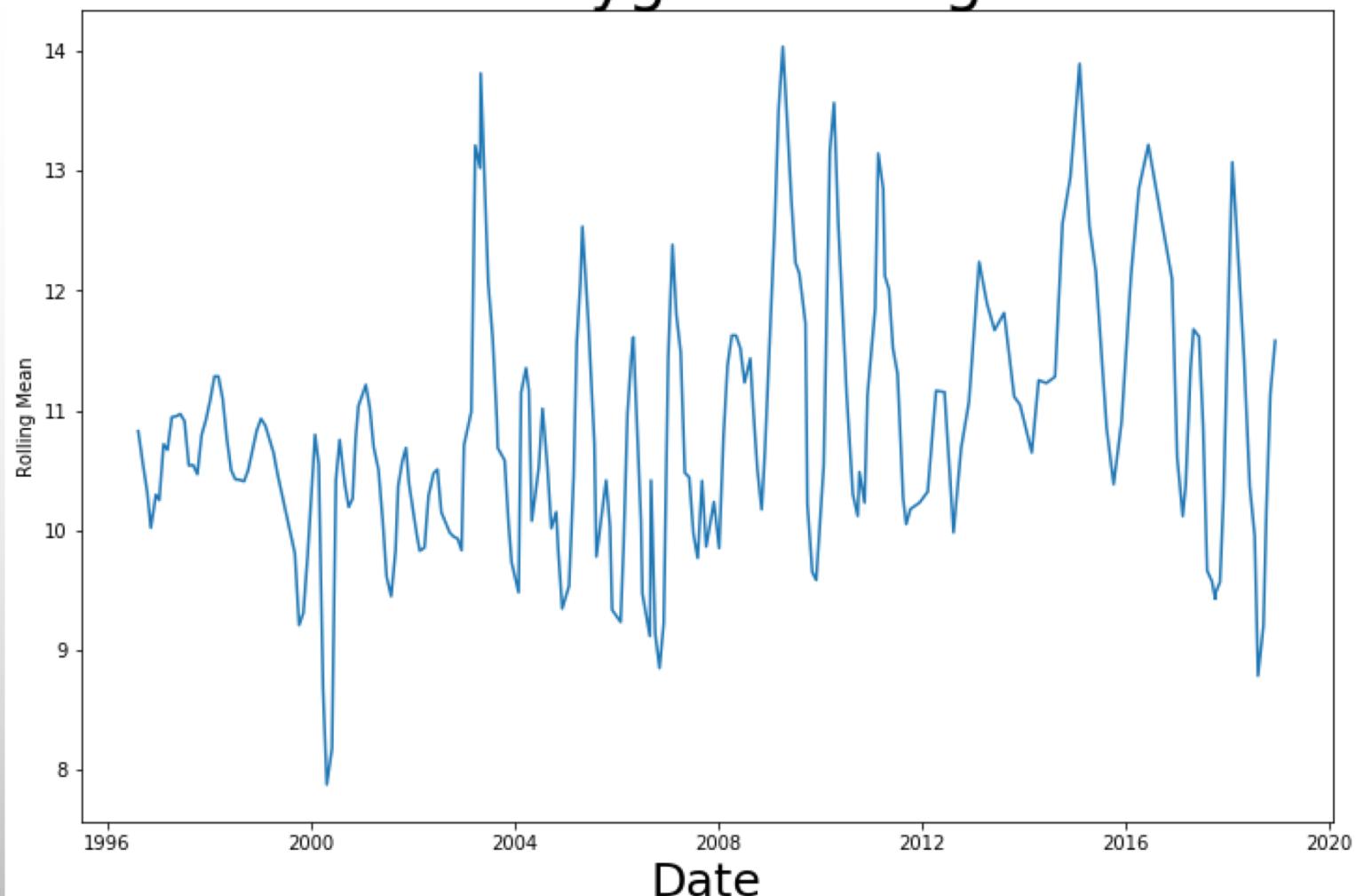


AGGREGATED THE DATA WITH
THE AVERAGE VALUES OF ALL OF
THE TESTING SITES.

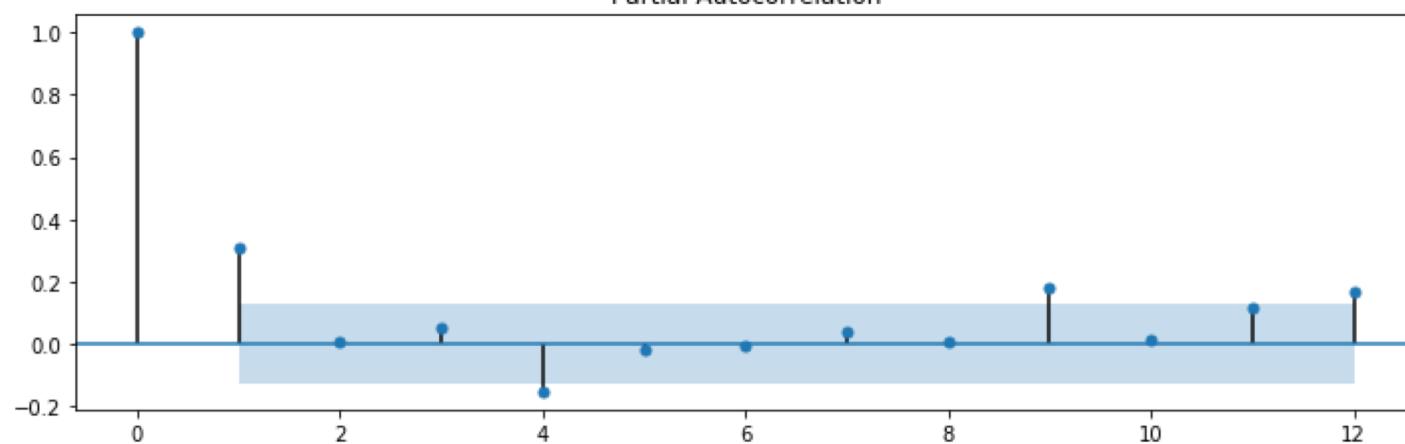
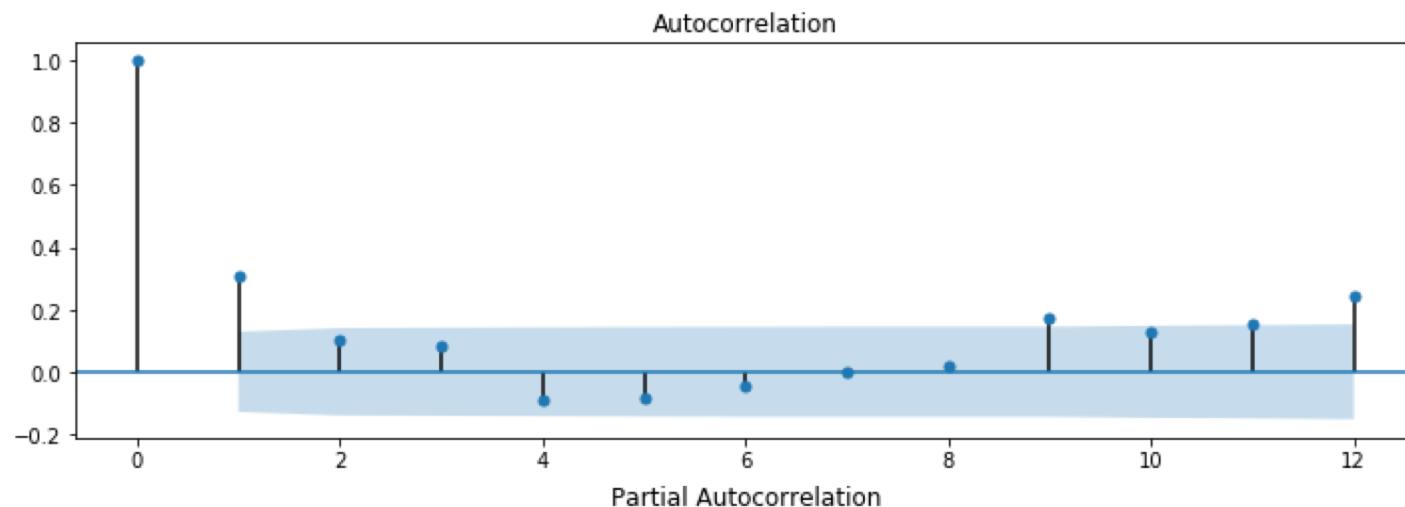


233 DATA POINTS FROM JUNE
8TH 1996 TO DECEMBER 10TH
2018

Dissolved Oxygen Rolling Mean 3



Dissolved Oxygen Lag 12



DATA METRICS

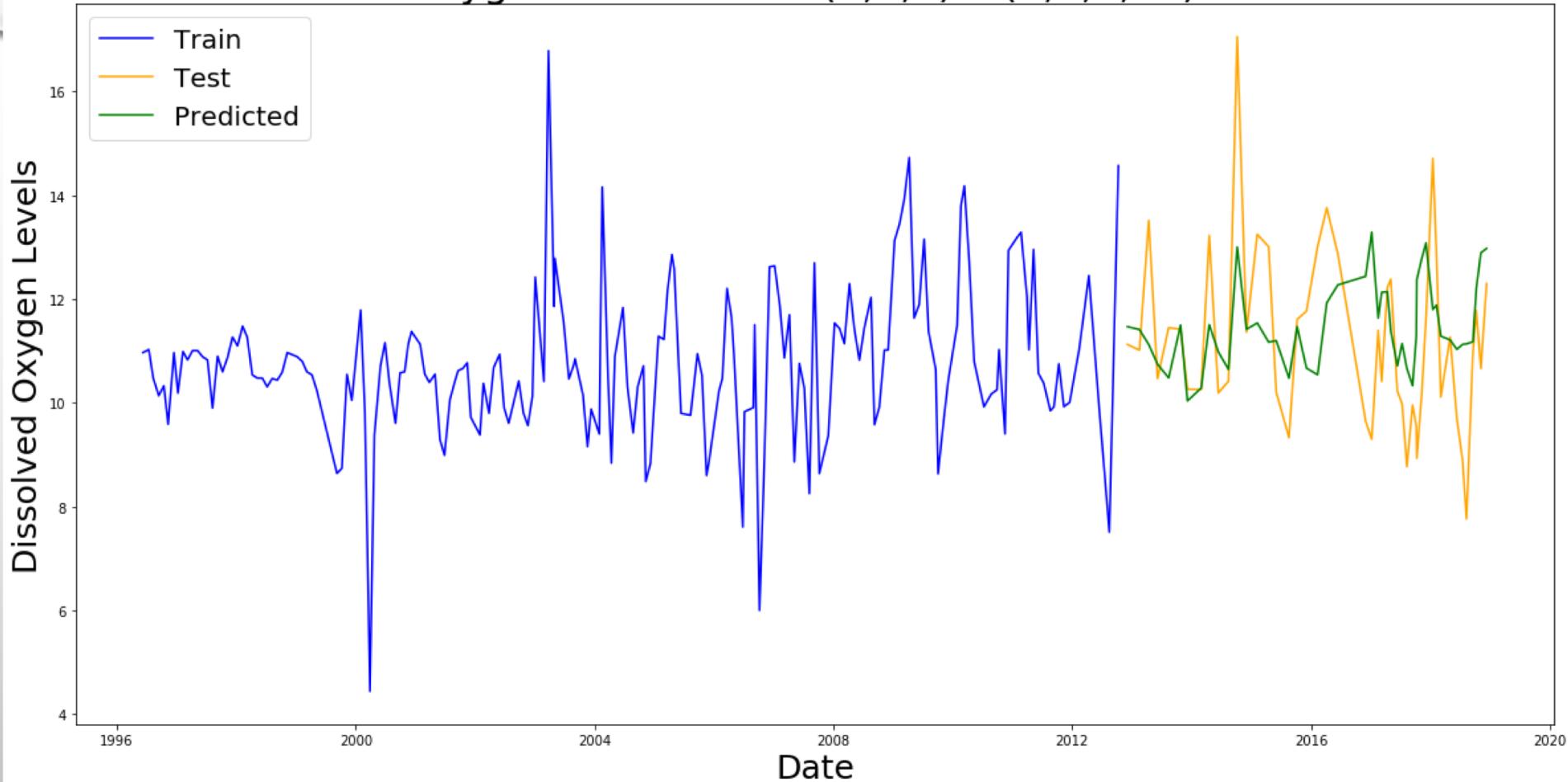
- **DICKEY FULLER:**

- P VALUE: 8.057773505476658E-20

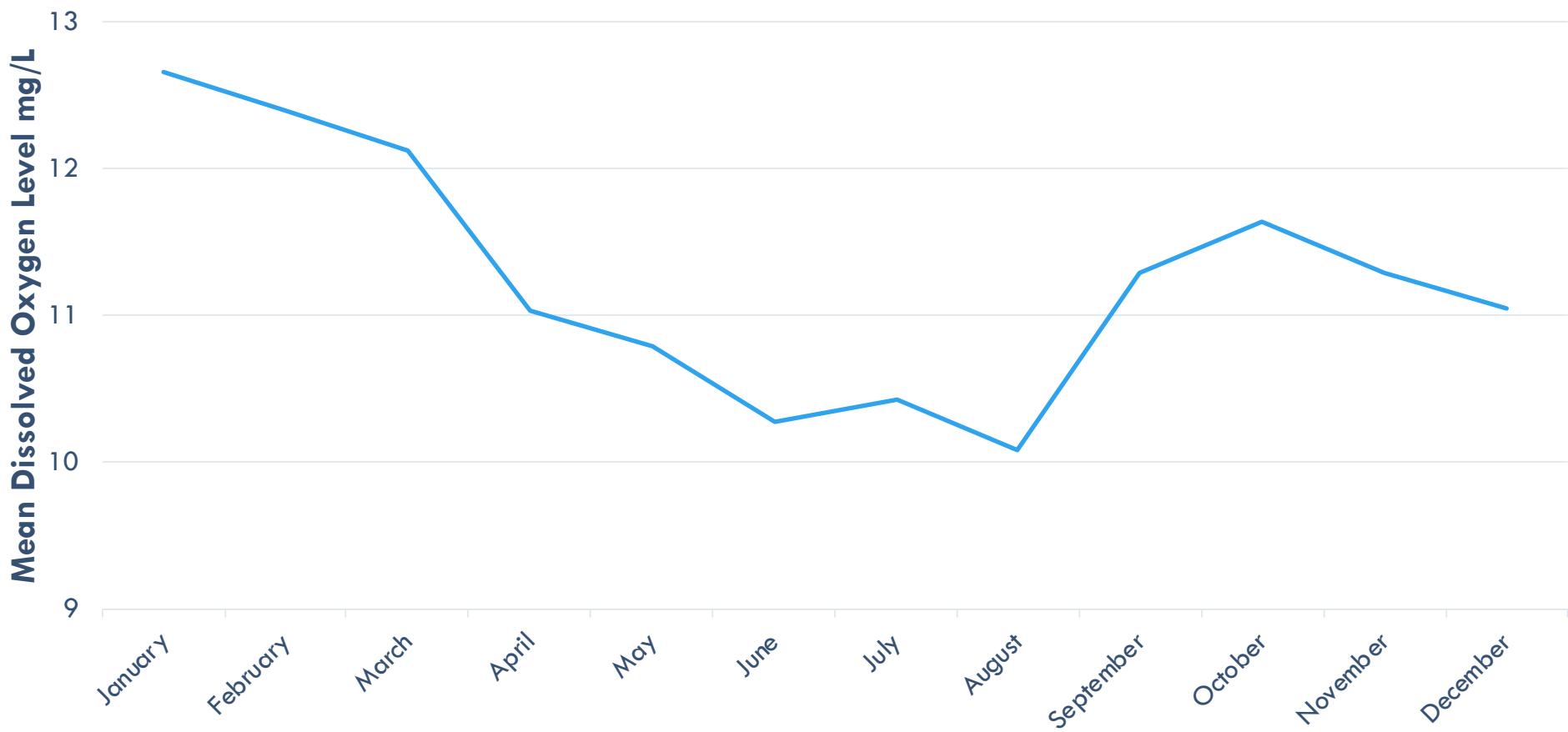
- **MEAN**

- 10.739188723462918

Dissolved Oxygen with SARIMA(3,0,2) x (4,0,5,12) Predictions



Forecasted Dissolved Oxygen Levels



NEXT STEPS



Look at each location individually



More research into why the data is flatter before 2000



Look at why the levels at MG1, MG2 and WL are more variable than the LT sites.



Compare analysis to other stream data to see how health compares.