



Data Analytics Course  
DAB-14



# Decoding the Flow

**Data analysis of Online Anomaly Detection  
for Drinking Water Quality**

Fatema Alalawi  
Fatema Hilal  
Mohamed



# Introduction

Ensuring the continuous safety of drinking water is a critical public health priority.

Leveraging data from an existing online anomaly detection system for drinking water, This project provides a comprehensive analysis of its output.

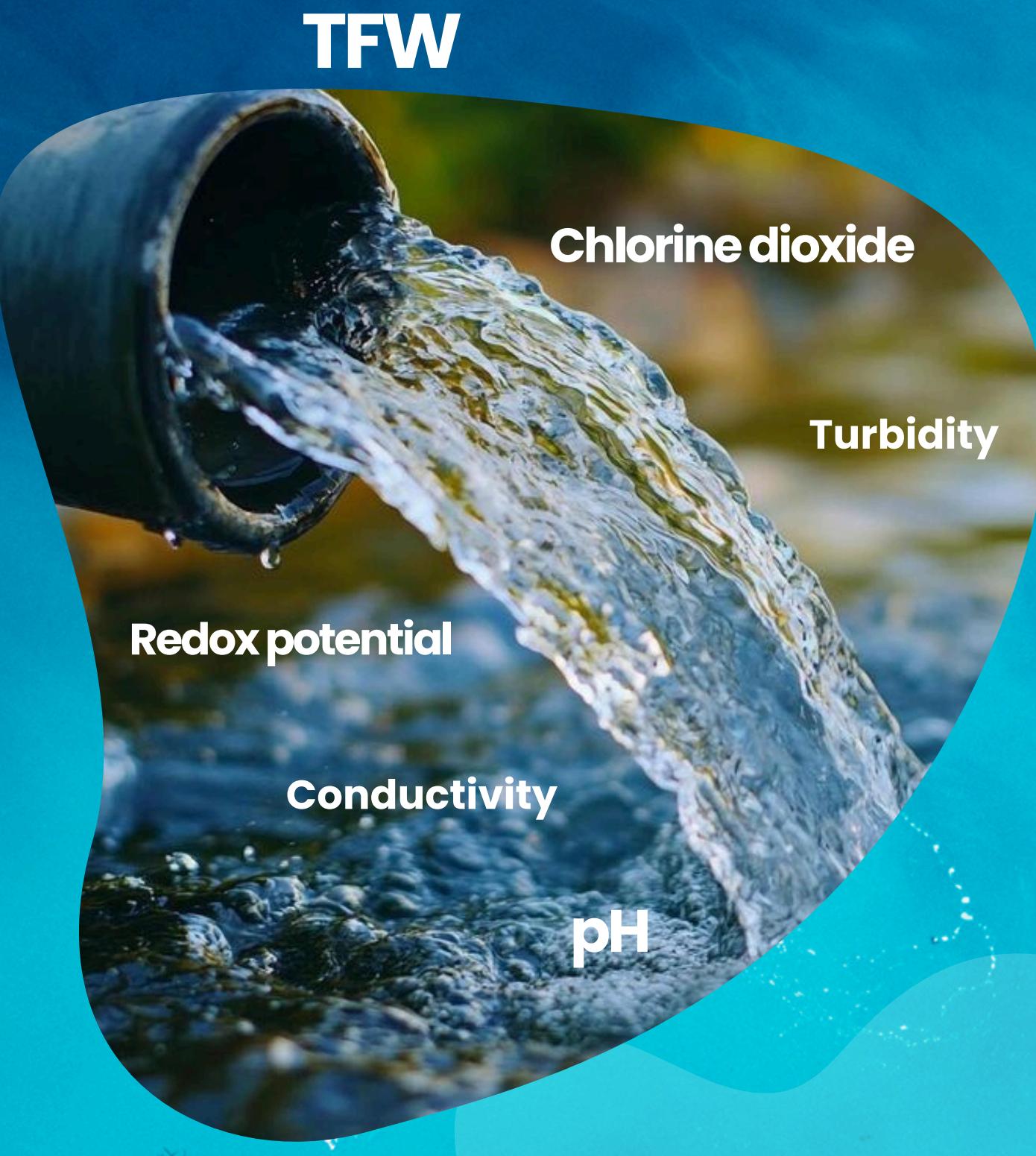
A deep-dive analysis was Performed by:

- Identifying and validating potential anomalies.
- Visualizing parameter trends over time to assess stability.
- Exploring Parameter Relationships Through Correlation Analysis

This detailed analysis confirms the water quality is safe, providing crucial insights that validate the system's findings and ensure public confidence.

# Problem Statement

- While an online anomaly detection system provides a useful detection for changes in the water quality indicators but to be fully actionable requires in-depth analysis
- This raw data lacks context on parameter relationships and long-term trends, limiting confidence in water safety at change detection
- Therefore; we provide a comprehensive, data-driven analysis that validates system findings and proves drinkability of water quality at change detection.



# Aim and Objectives

**Validating Safety of Drinking Water**



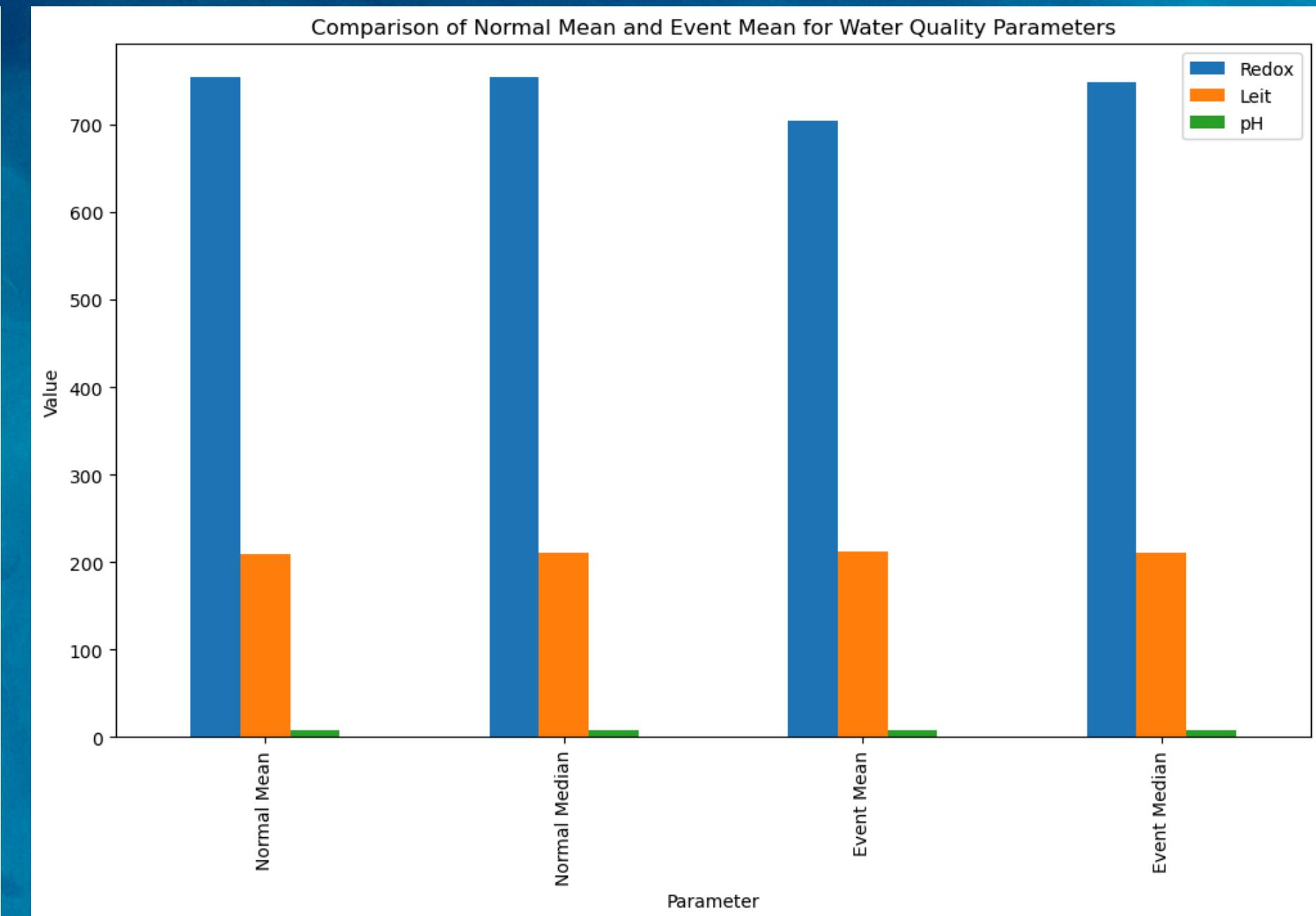
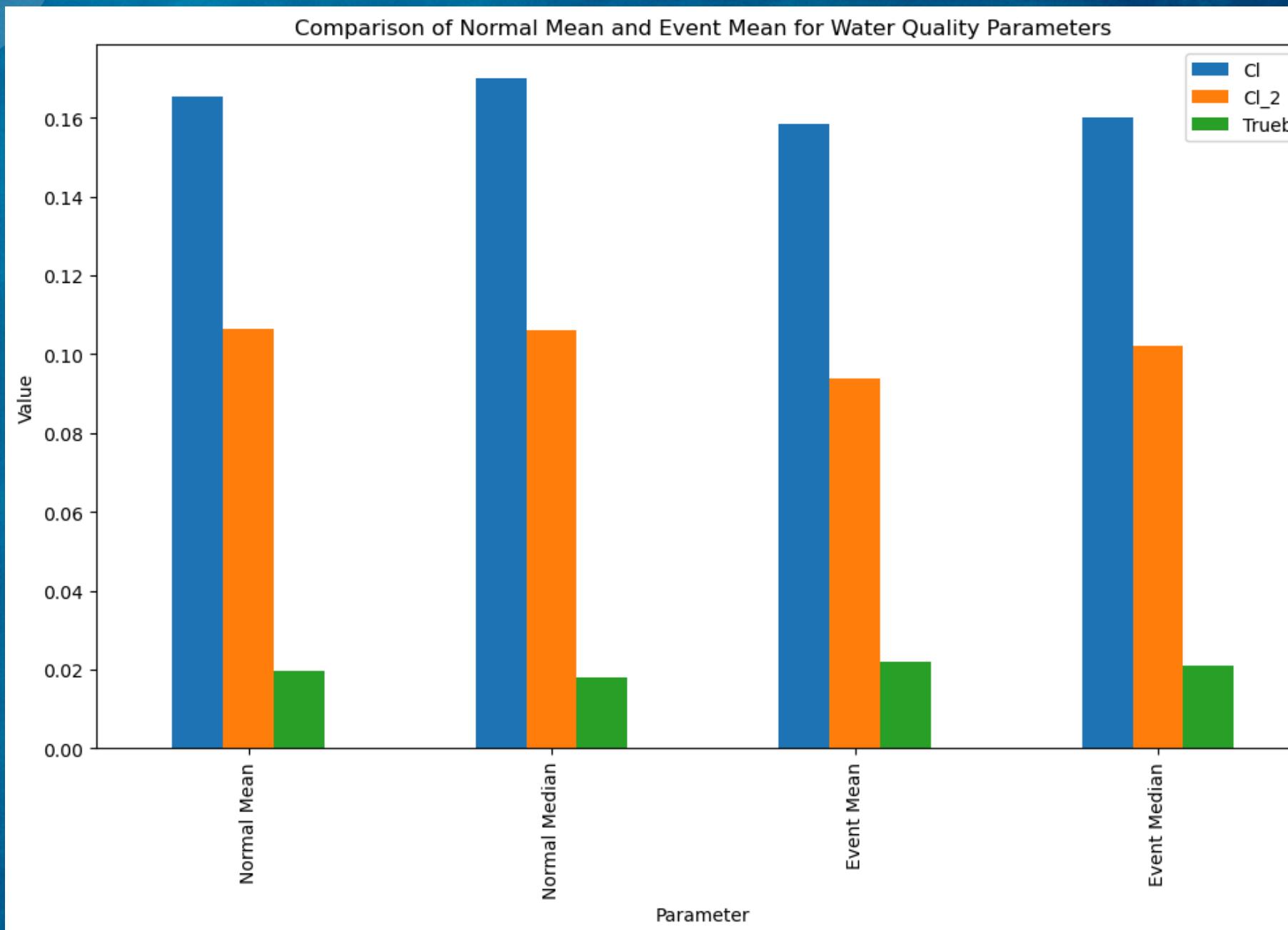
Identifying and validating potential anomalies

Visualising parameters trends over time

Exploring parameter relationships through correlation analysis

# Analysis

## PART 1: Identifying and Validating Potential Anomalies



# Analysis

## PART 1: Identifying and Validating Potential Anomalies

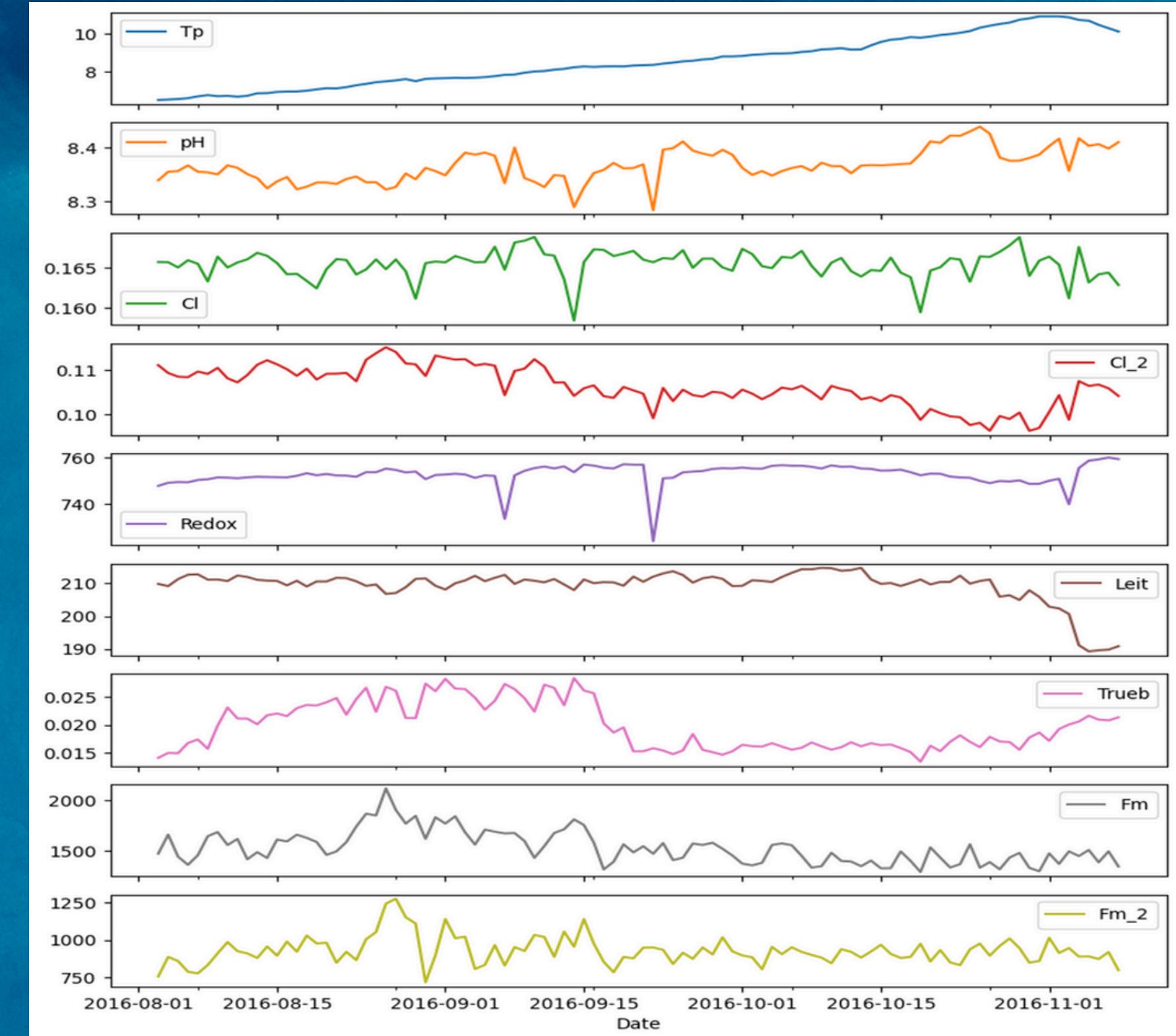
	Cl	Cl_2	pH	Redox	Leit	Trueb
Event Mean	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Event Median	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

# Analysis

## PART 2: Visualizing Parameter Trends Over Time

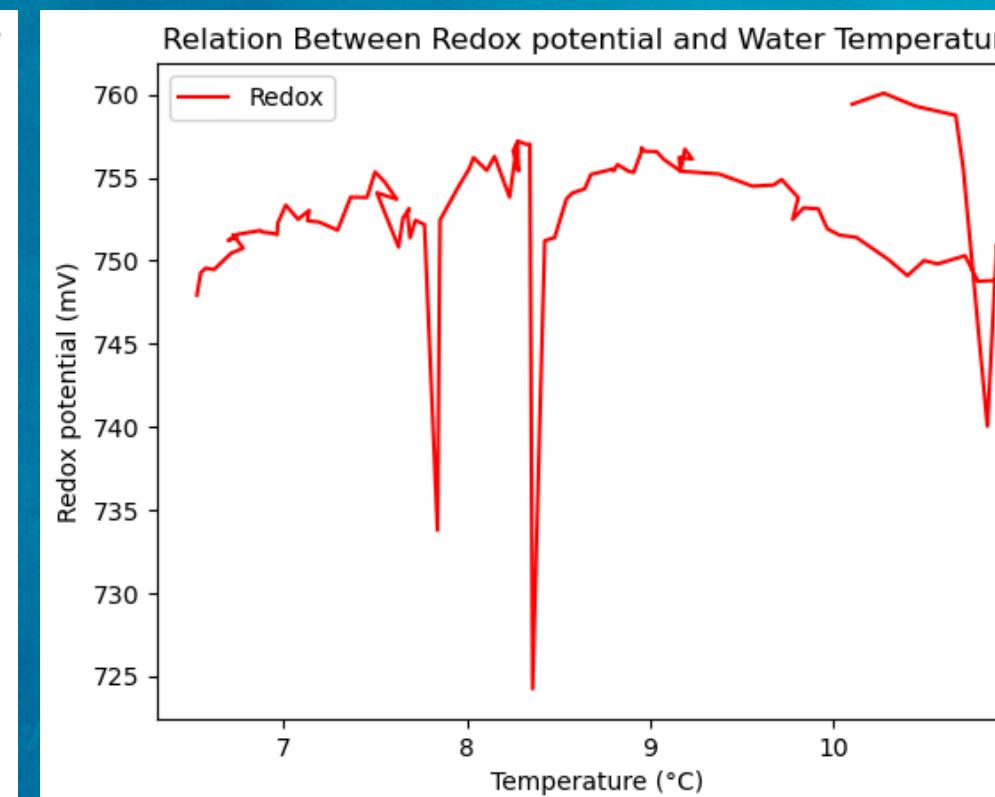
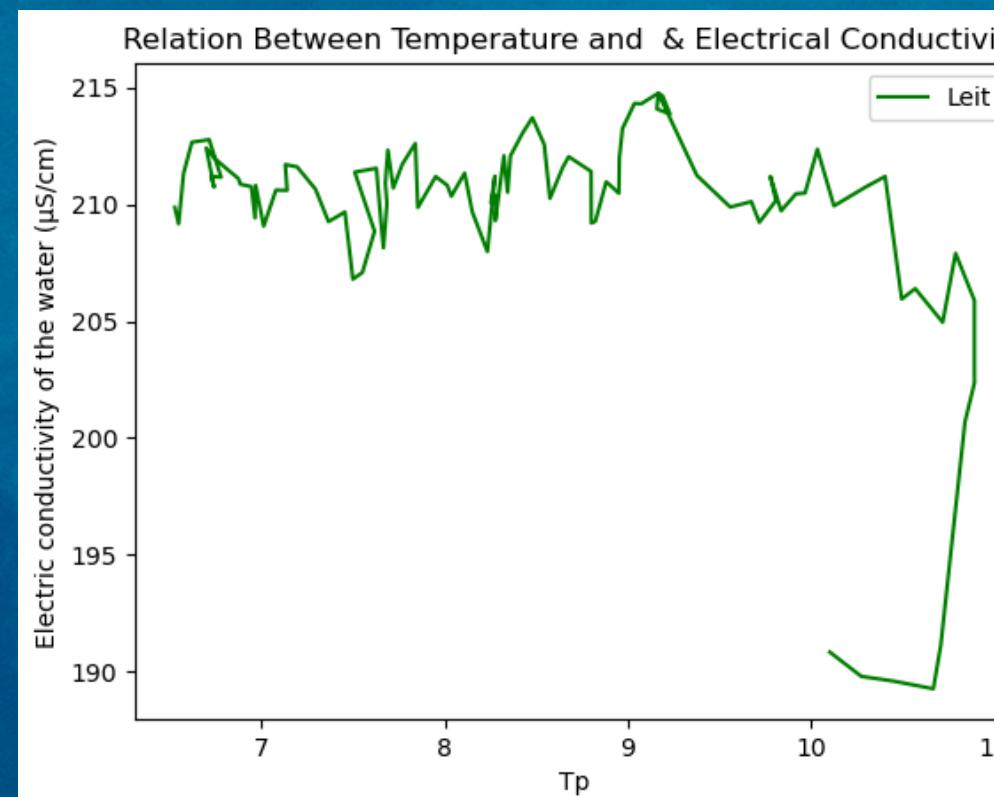
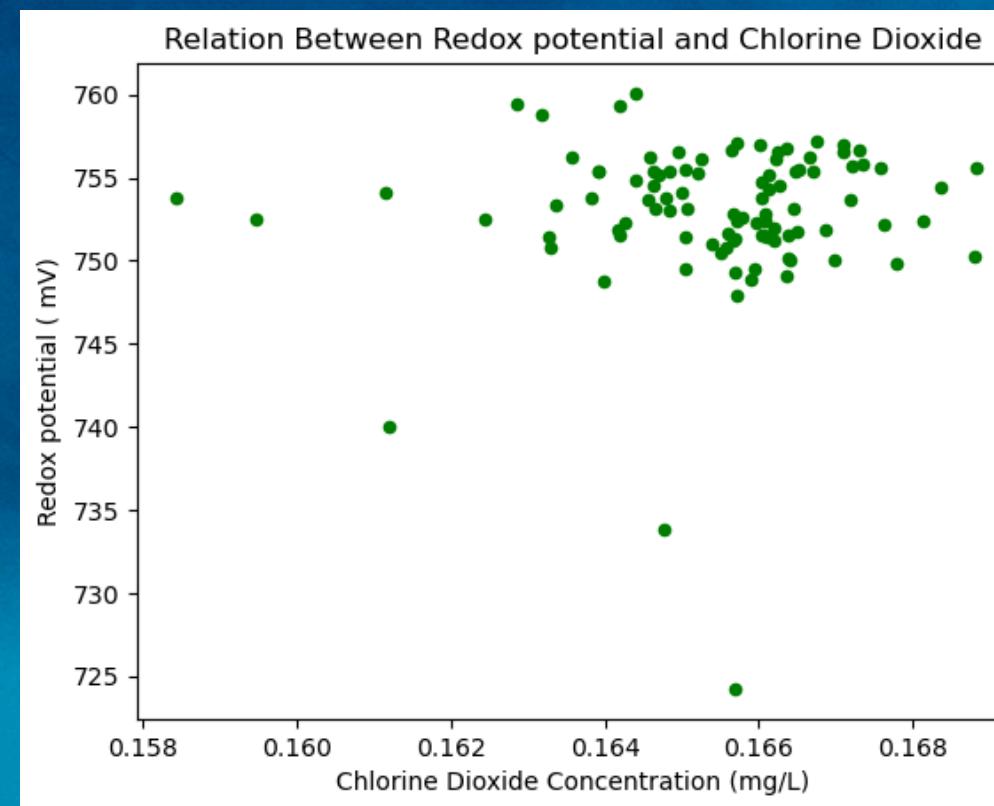
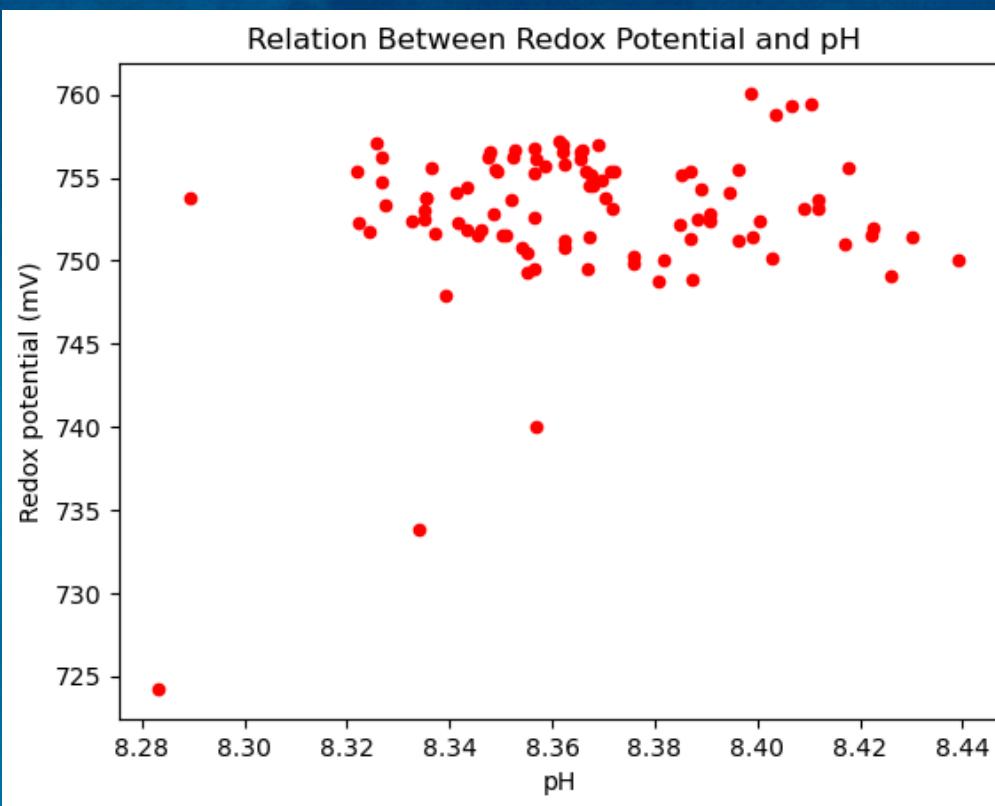
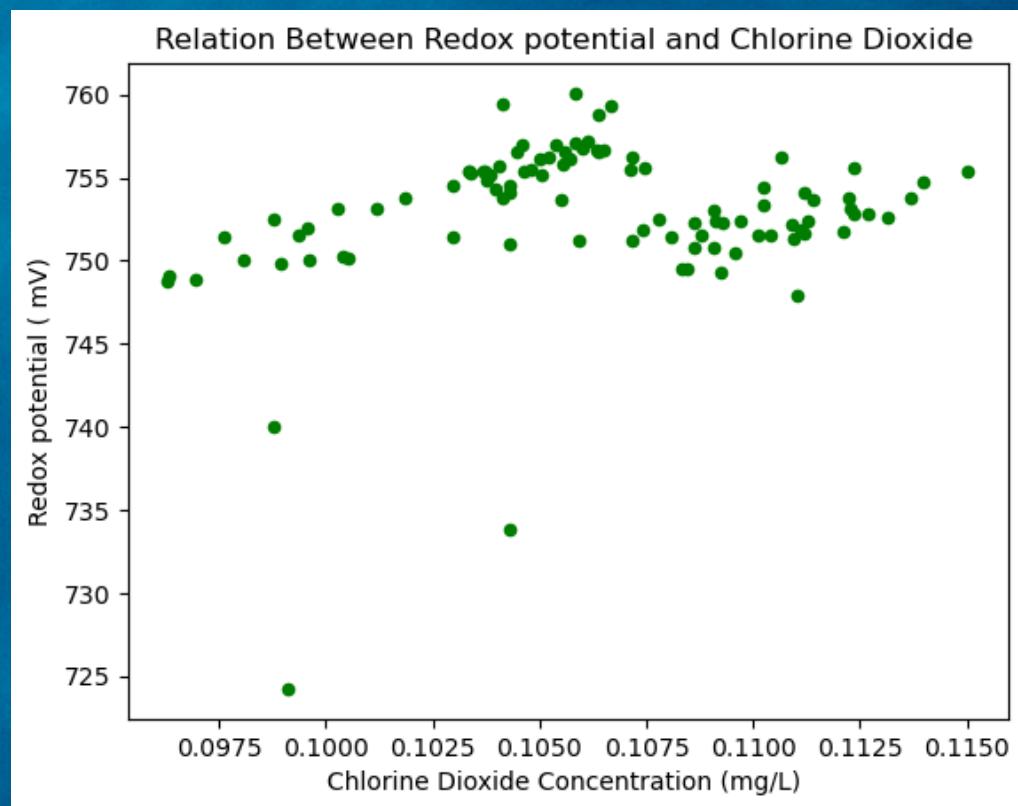
Safety Standards:	
Temperature	6.5 - 8.5
Turbidity	<25°C
Chlorine	0.2 - 0.5 mg/L
Redox	>650 mV
Conductivity	<500 µS/cm (0.0005 S/cm)

The safety standards for parameters affecting water quality, according to WHO (World Health Organization)



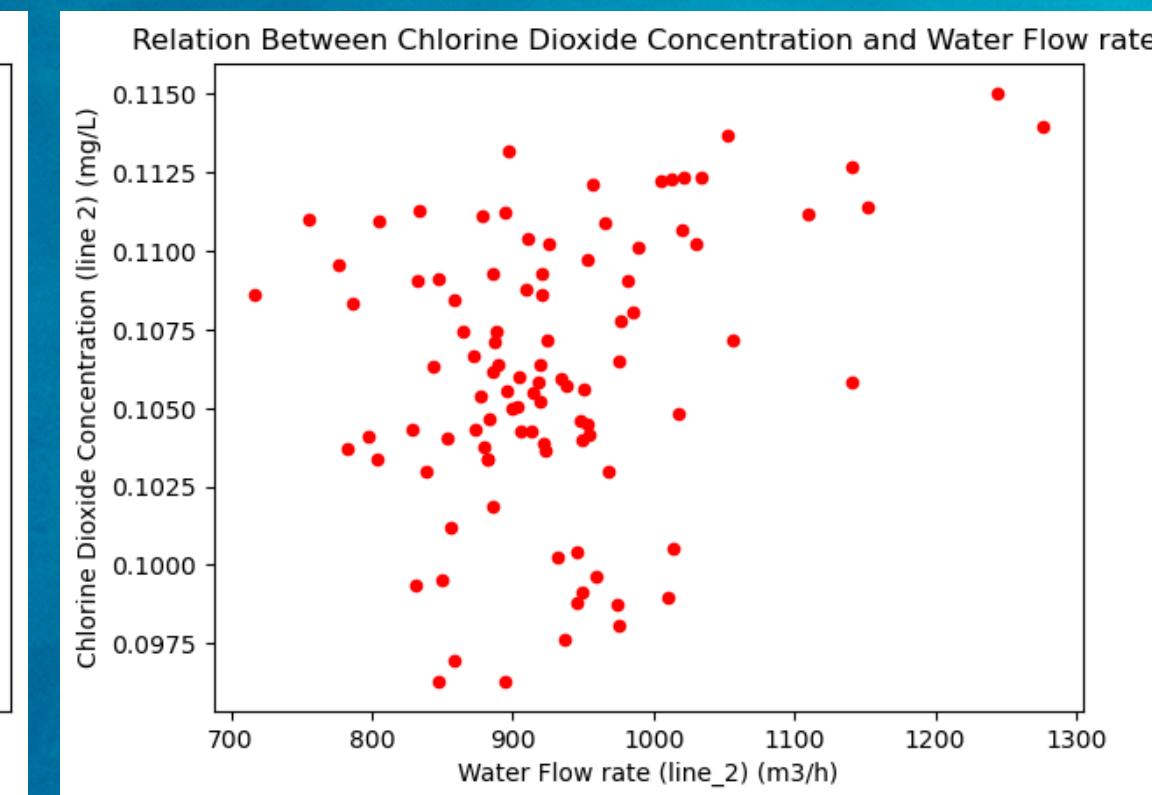
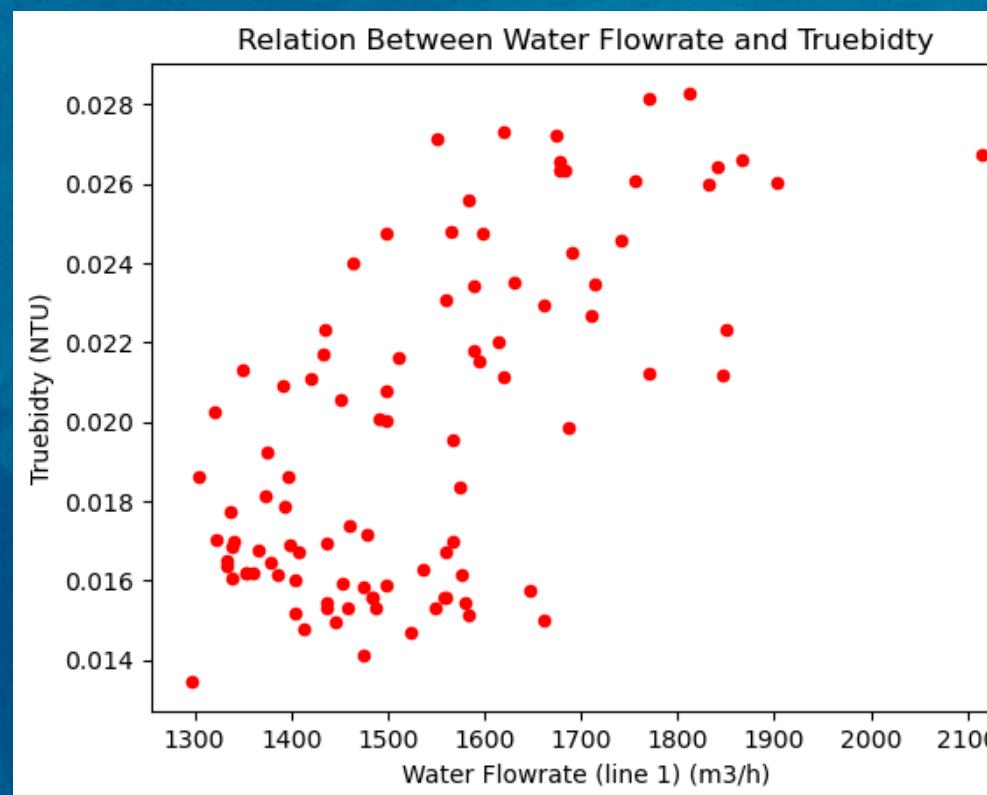
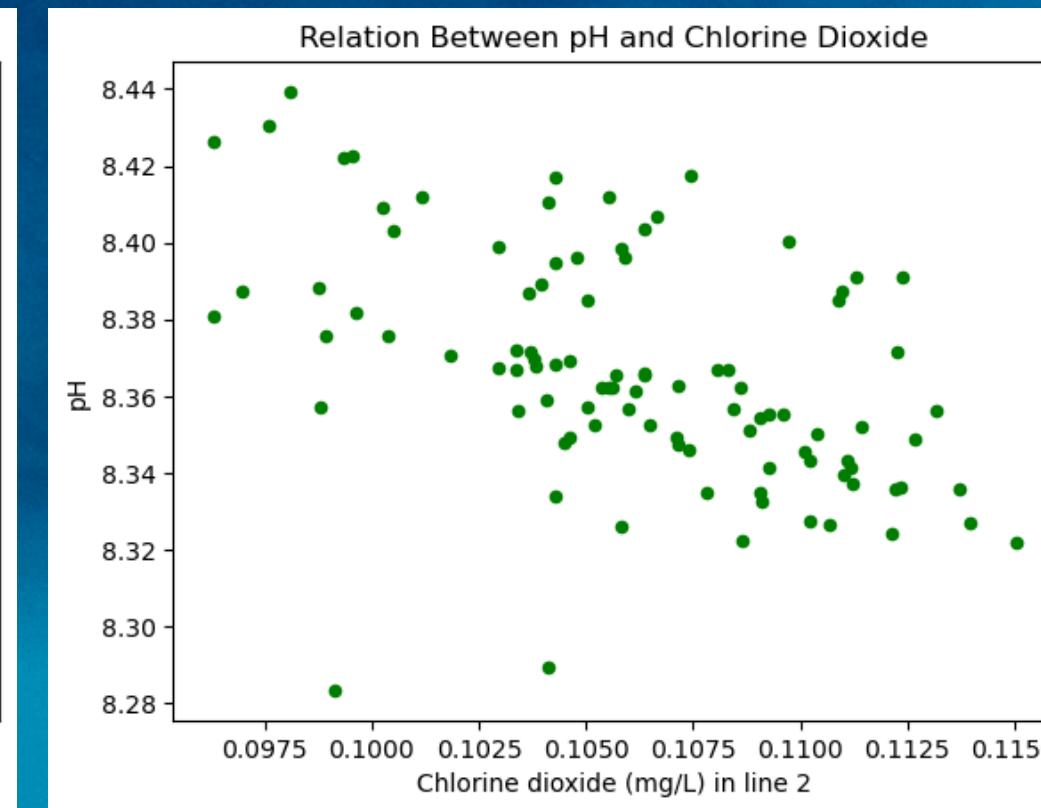
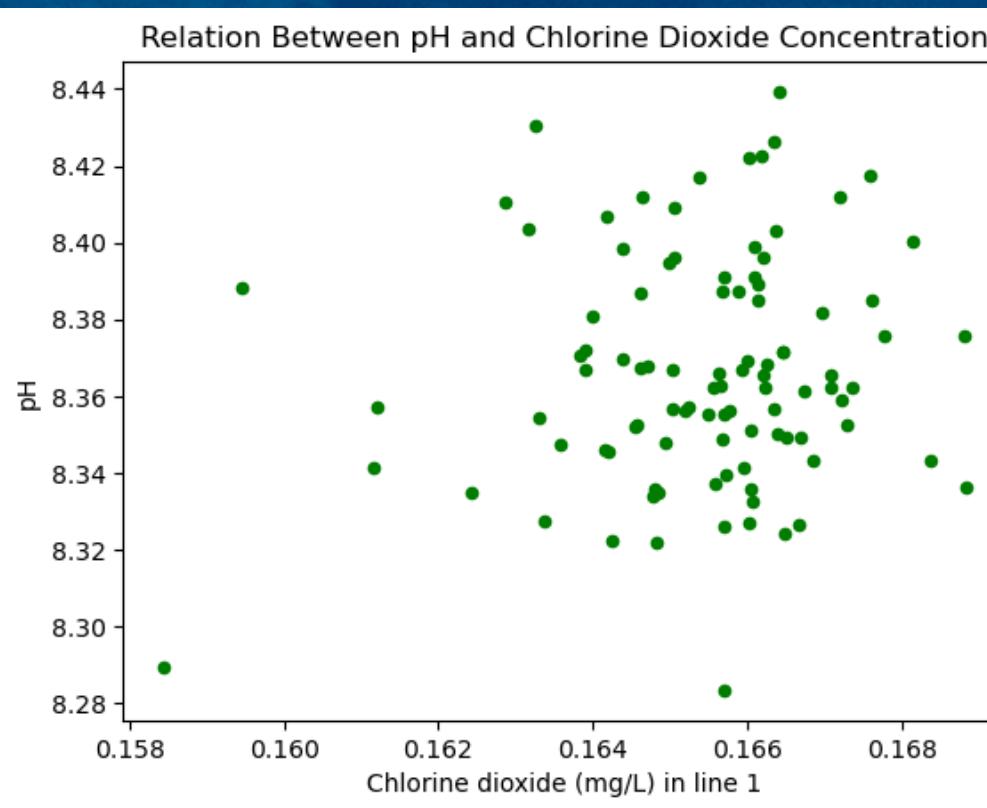
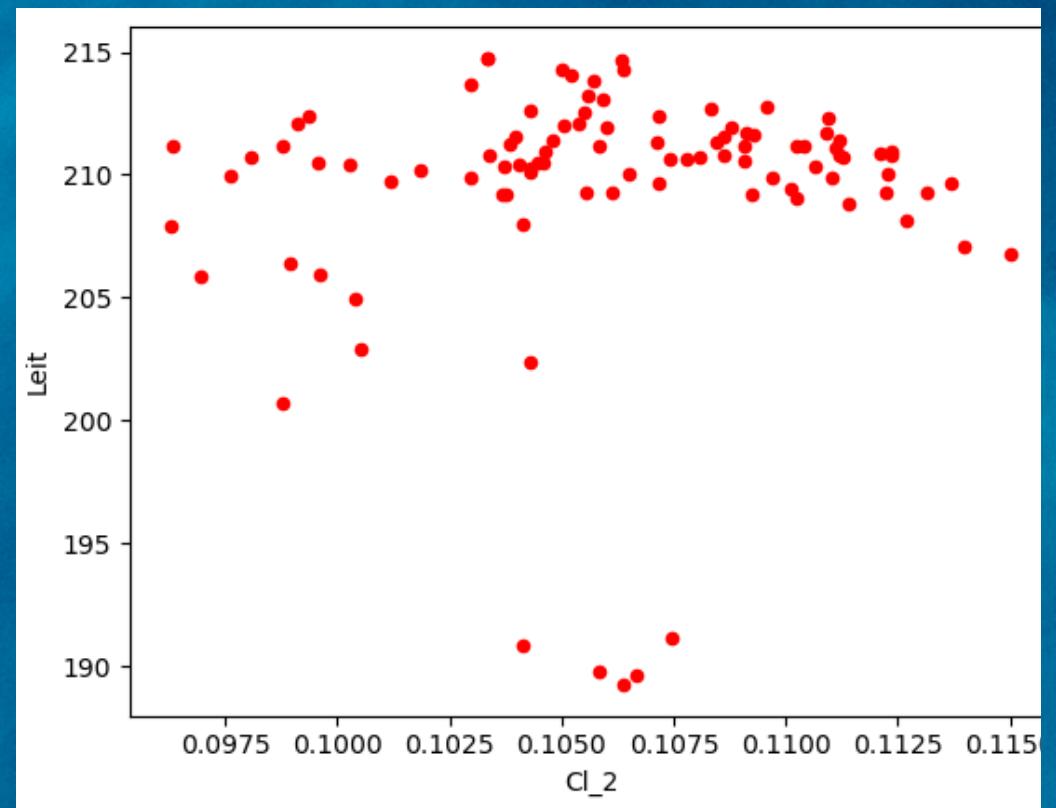
# Analysis

## PART 3: Exploring Parameter Relationships Through Correlation Analysis



# Analysis

## PART 3: Exploring Parameter Relationships Through Correlation Analysis



# Conclusion

The analytical process confirms the water is safe for drinking despite the presence of some anomalous changes, providing crucial insights that ensure public confidence in a vital resource.

Furthermore, our analysis revealed that while some water quality parameters are correlated, others show no correlation, even when it is chemically plausible. This discrepancy suggests either sensor inaccuracies or the presence of other factors influencing the readings.

# Q & A



# Thank You!

