

Reservoir / Catchment Health

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Context and Objectives

What are we trying to achieve?

- Understand reservoir / catchment data patterns
- Identify risks / anomalies
- Recommended monitoring and simple predictive tools

Data Science Approach

- Examine data & take hand written notes
- Tools:
 - Hypothesize in R, Productionize in Python
 - Viz: ggplot2, esquisse, patchwork, Streamlit for production
 - git for version control
 - AI - Co-Pilot / ChatGPT, Visual Studio Code
- Initial EDA
 - Biased Data Detection
 - Missing Value Analysis
 - Outlier Detection
-

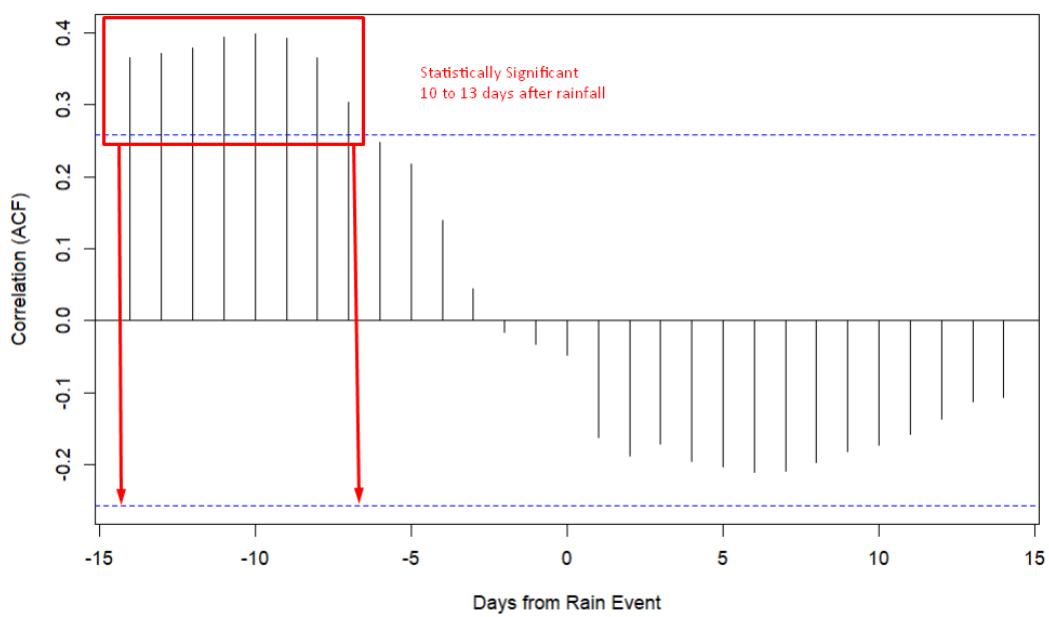
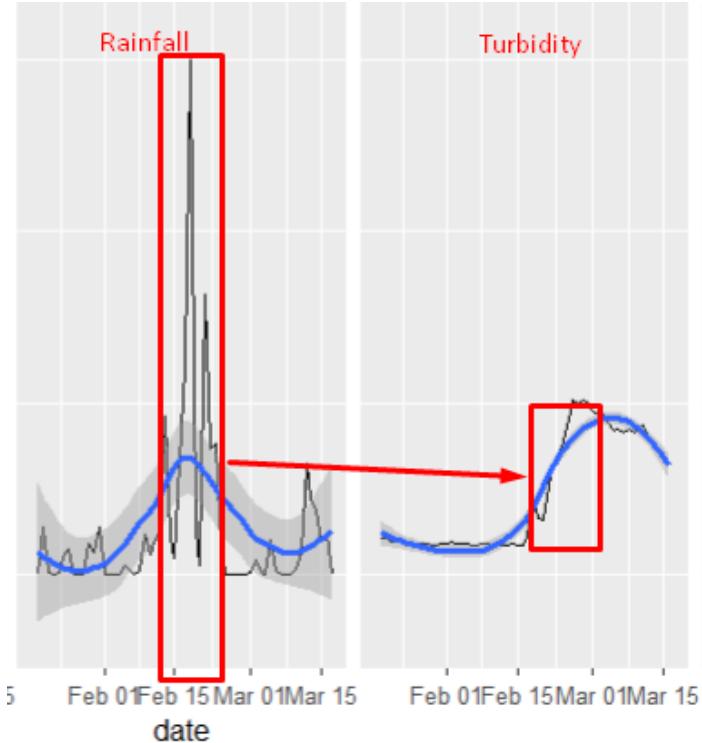
Analysis

- Sense check interpretations and AI results with SME - flood modeler, engineer, and water economist

Key Insights and Findings

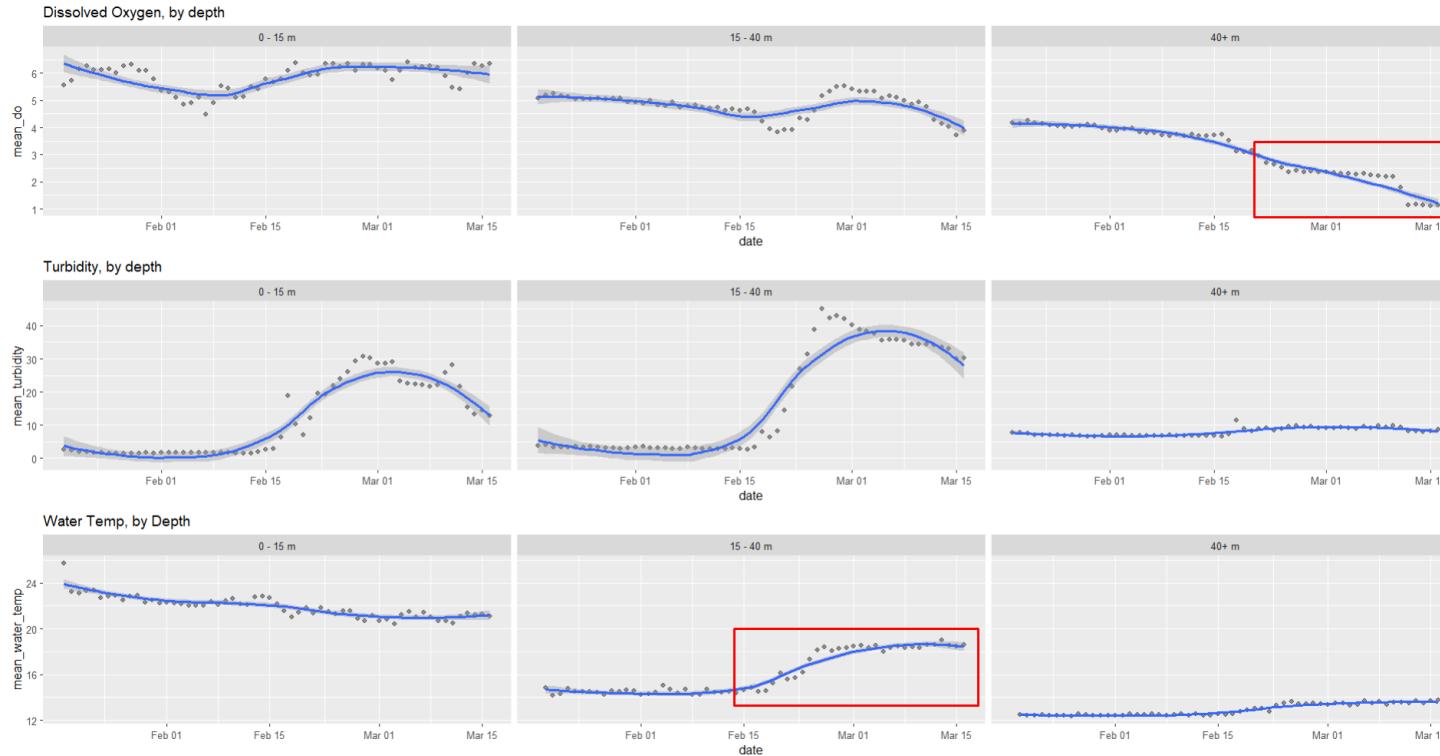
Key Insight 1: Rain -> Turbidity Lag Effect

- Sharp rise in turbidity follows peak rain event
- CCF Plot supports this relationship



Key Insight 2: Depth Analysis

- DO stable at 0 - 40m - suggests algal bloom risk lower.
- Water Temperature increases over time, as temperature would cool?



Slide with R Output

```
summary(cars)
```

```
##      speed          dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Slide with Plot

