

# Reservoir / Catchment Health

Paul Yacobellis

2026-01-31

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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
- 

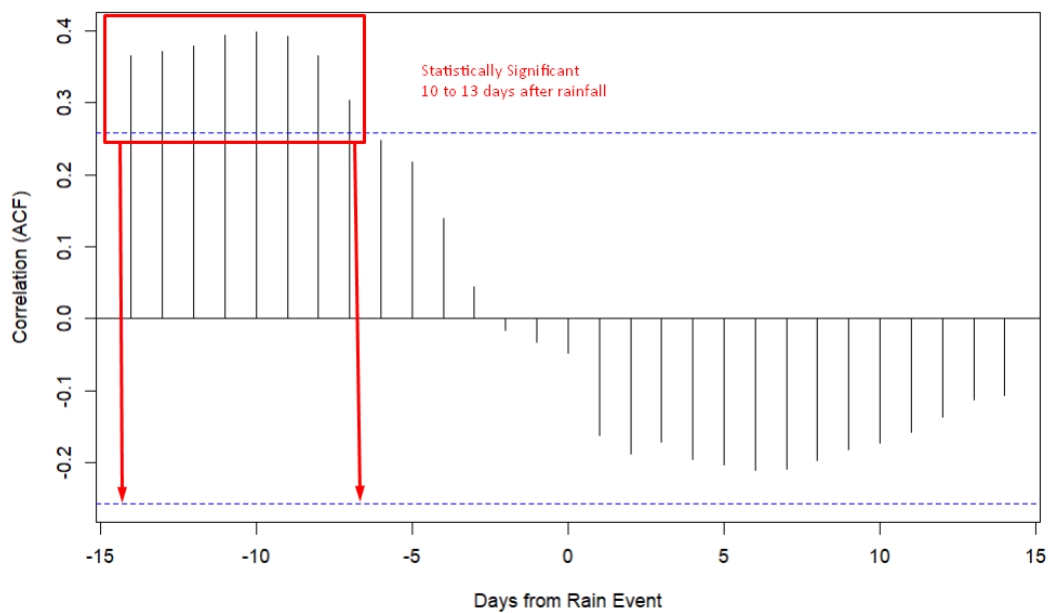
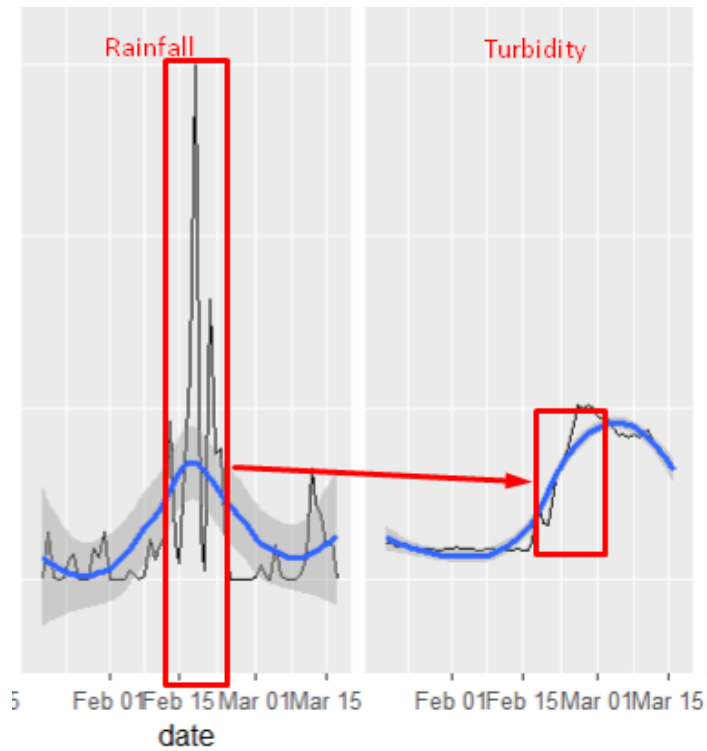
## Analysis

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

## Key Insights and Findings

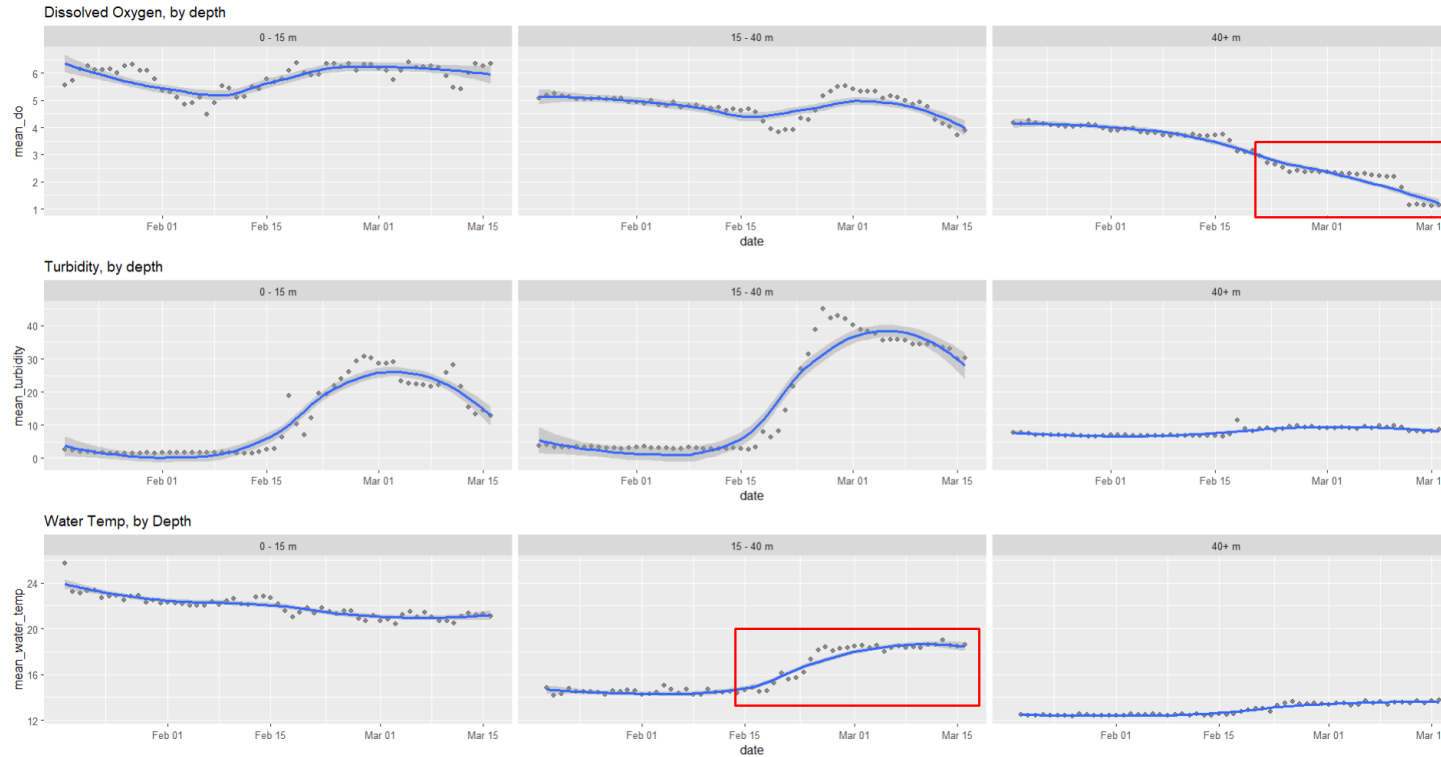
### Key Insight 1: Rain -> Turbidity Lag Effect

- 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

