Environmental data analysis

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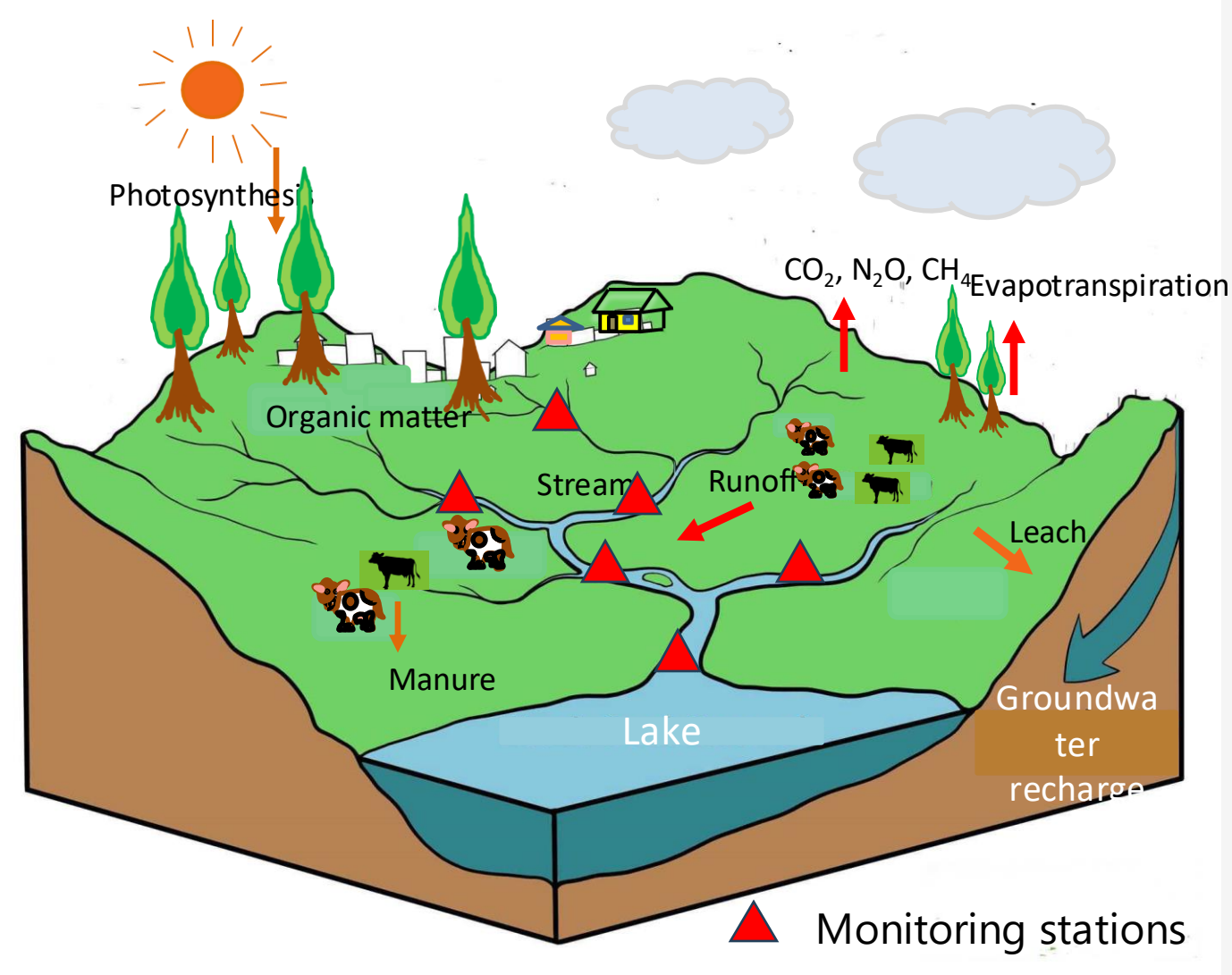
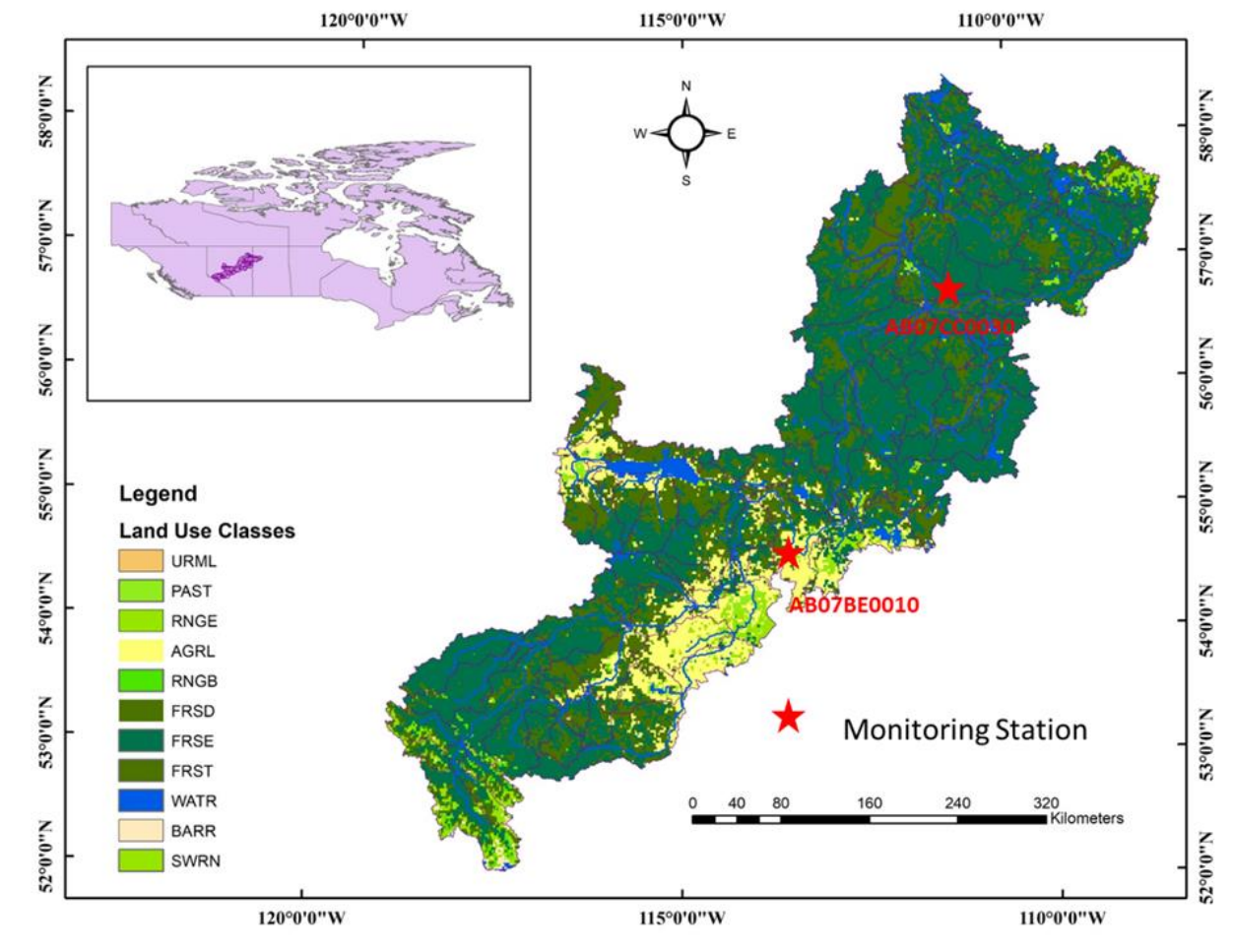
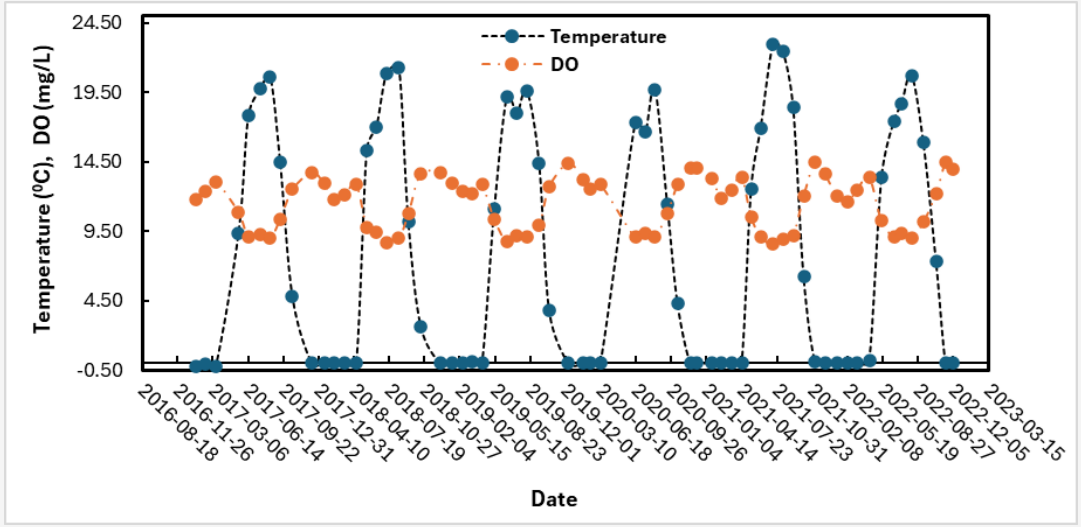
Background

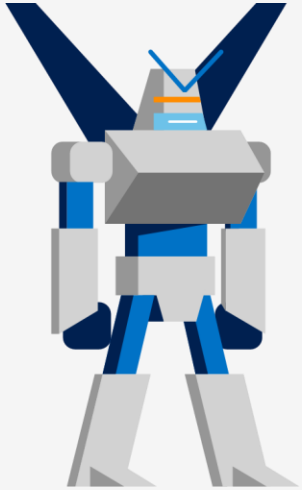
- Water, air and land resources and pollution
- **Monitoring Stations:** These measurements can help track the temporal and spatial origins of water over long periods of time.
- Monitoring data (e.g. time series data)
- Remote sensing (e.g., images)



Time series data and data analysis







What insights need to be extracted from a environmental dataset?

Trend: the gradual evolution trend over years. A trend is a smooth function of time, typical of a moving average of a time series where the moving average is over a window of several years duration.

Seasonality: the annual cycle of seasonal variation in water quality that is generally consistent from year to year, although it may gradually evolve over a period of years.

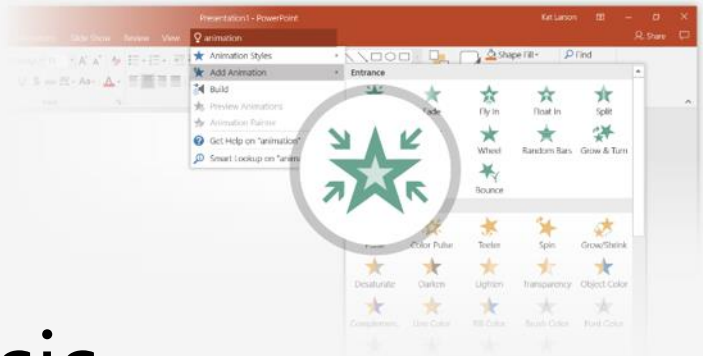
Patterns (Spatiotemporal distribution): The influence of discharge on water quality can evolve over space and time due to changes in the dominant processes.

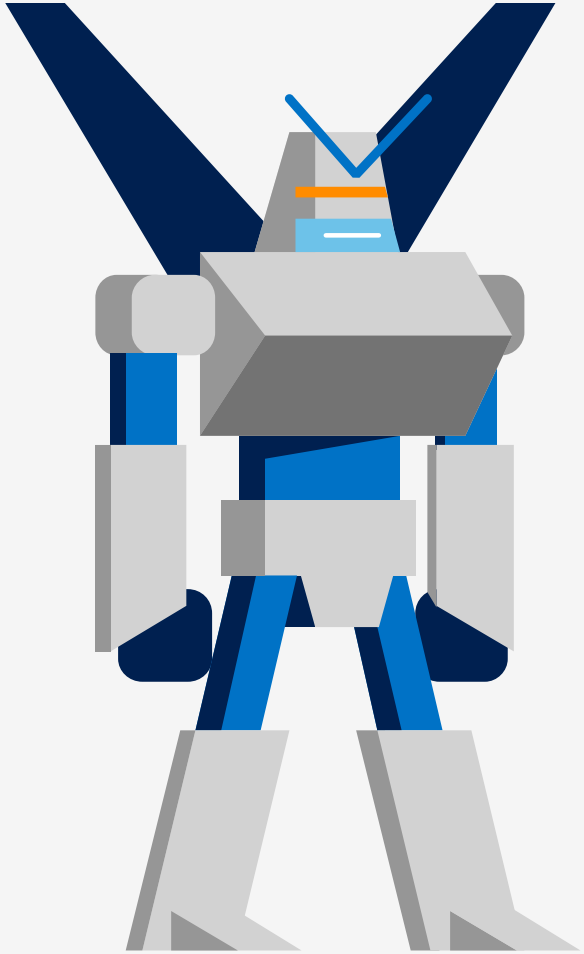
Random: after removal of the trend, seasonal, and discharge effects, there still remains a substantial the amount of unexplained variation in the concentration data, such as random errors.

Predictions: future variation.

Artificial intelligence and machine learning for data analysis

1. Machine learning
2. Data analysis
3. Environmental and resource management





Essay, Project, Thesis.

Question?

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