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## Introduction

- Water bodies are **dynamic** and **sensitive** to various factors of surrounding environment.
- Frequent monitoring is crucial to **track dynamics** of water mixing and **fluctuations** of water quality parameters.
- Use of Satellite Remote Sensing has proven to be **cheaper, faster** with better **spatio-temporal** coverage.
- Machine learning has demonstrated efficiency in **forecasting** of water quality parameters.

## Objectives

- To assess the **correlation** between the various oceanic and environmental variables.
- To **train** a machine learning model.
- To **assess the accuracy** of the machine learning model used.

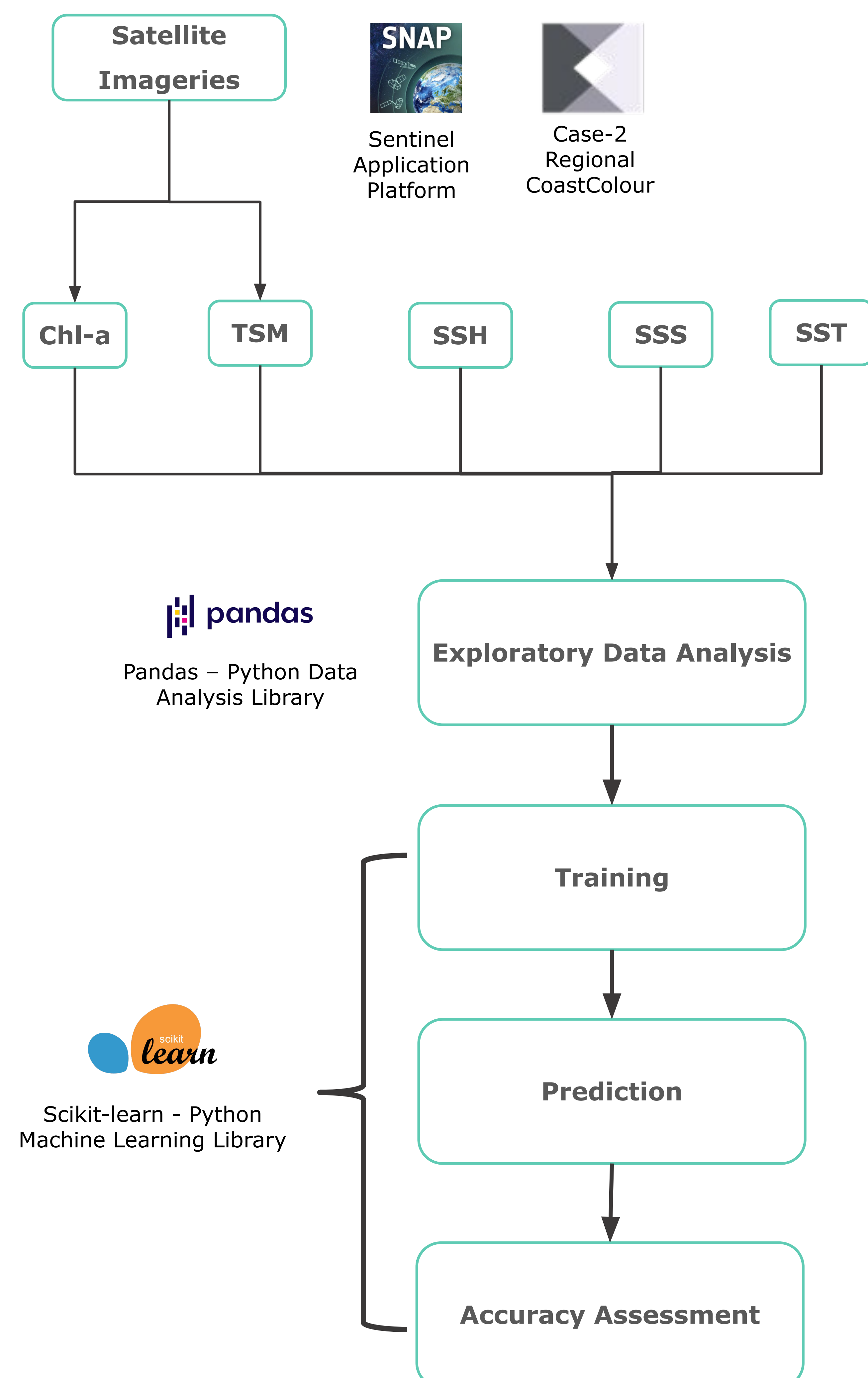
## Study Area

### Donegal Bay

- West coast of Ireland, along Atlantic Ocean.

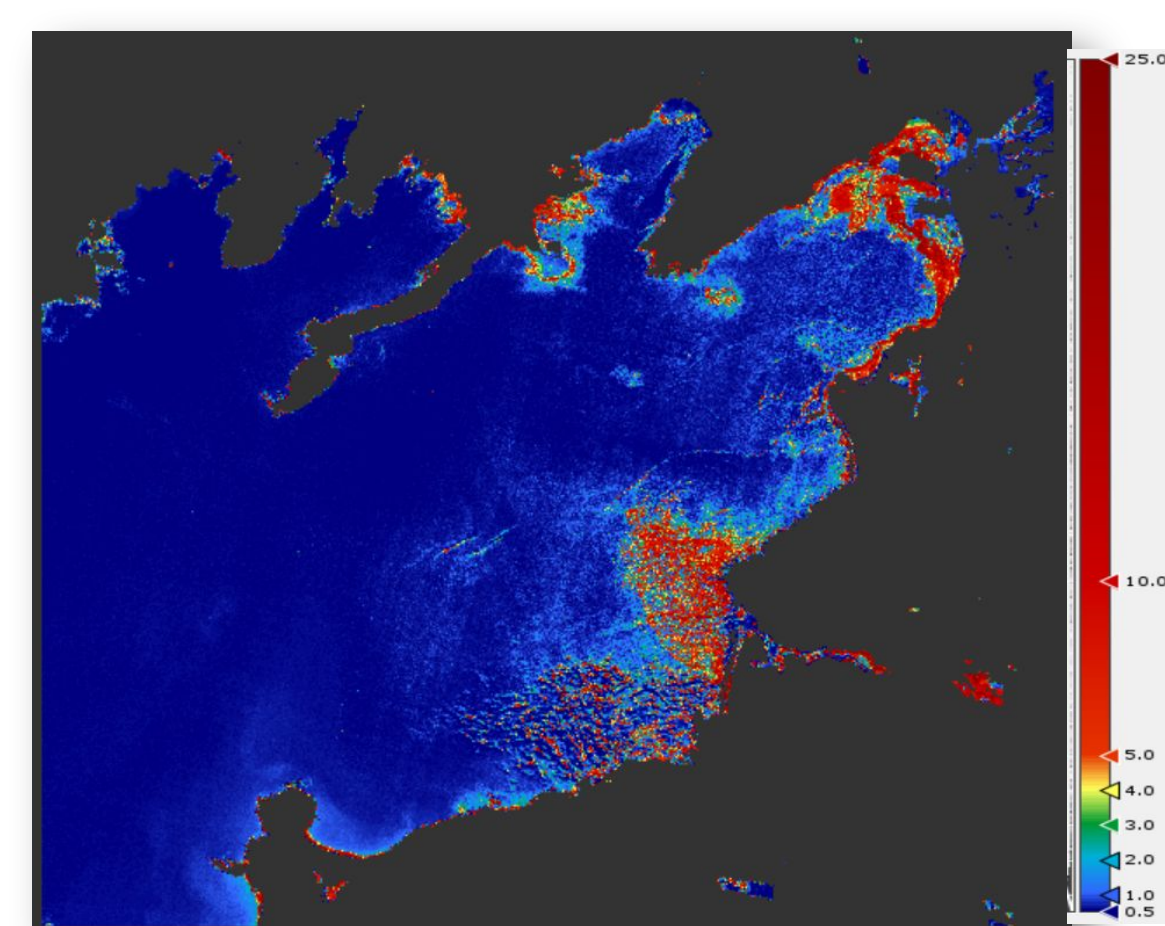


## Dataset, Tools and Approach

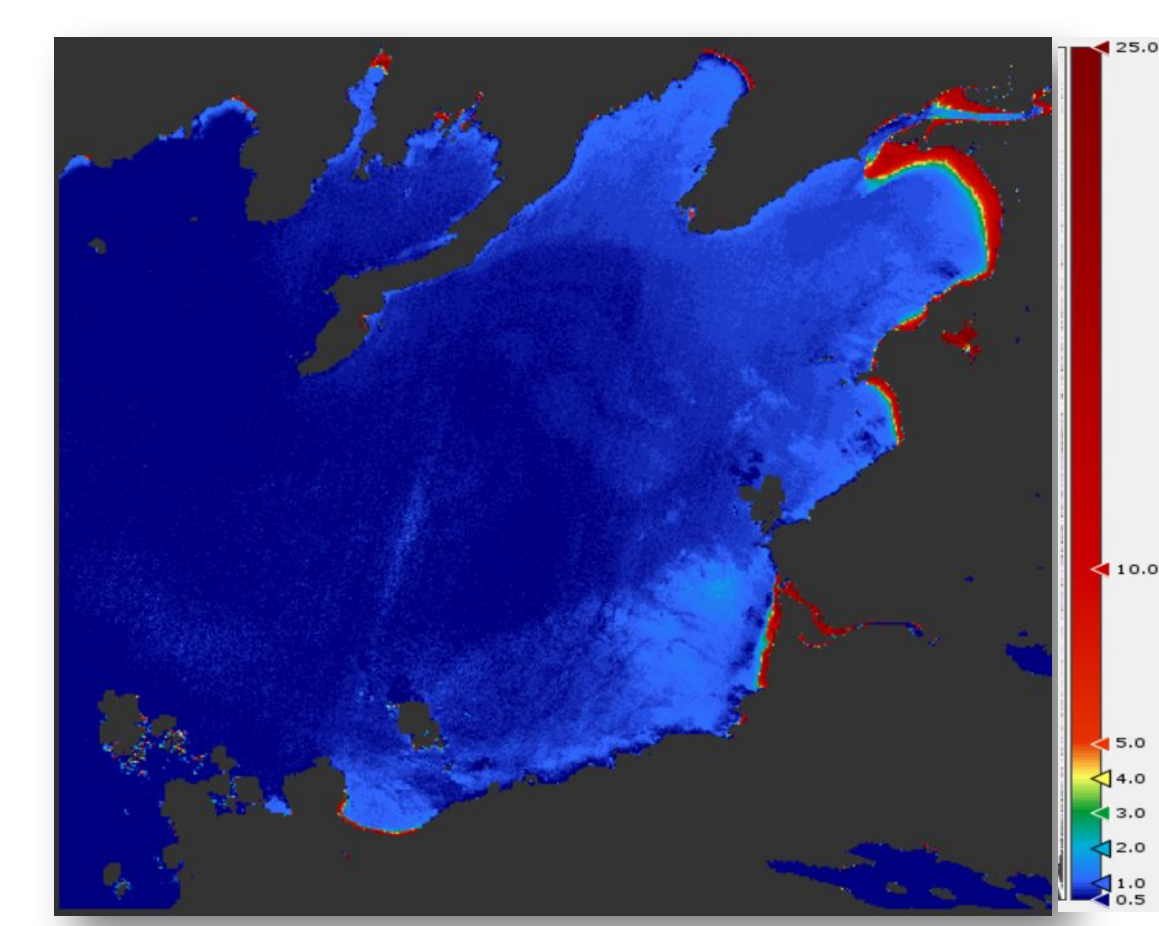


## Results

### Chl-a Concentration (mg/l)

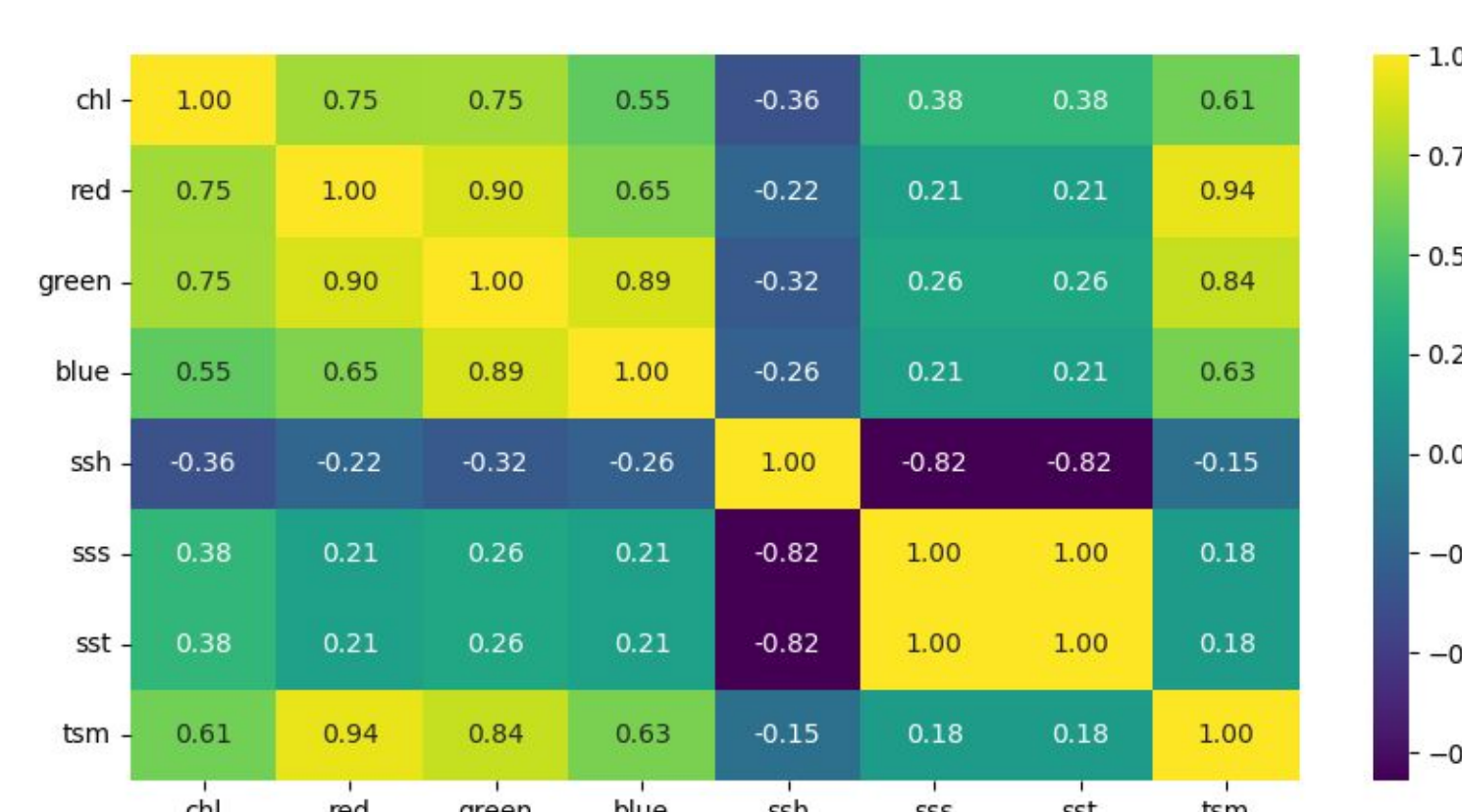


March 2023

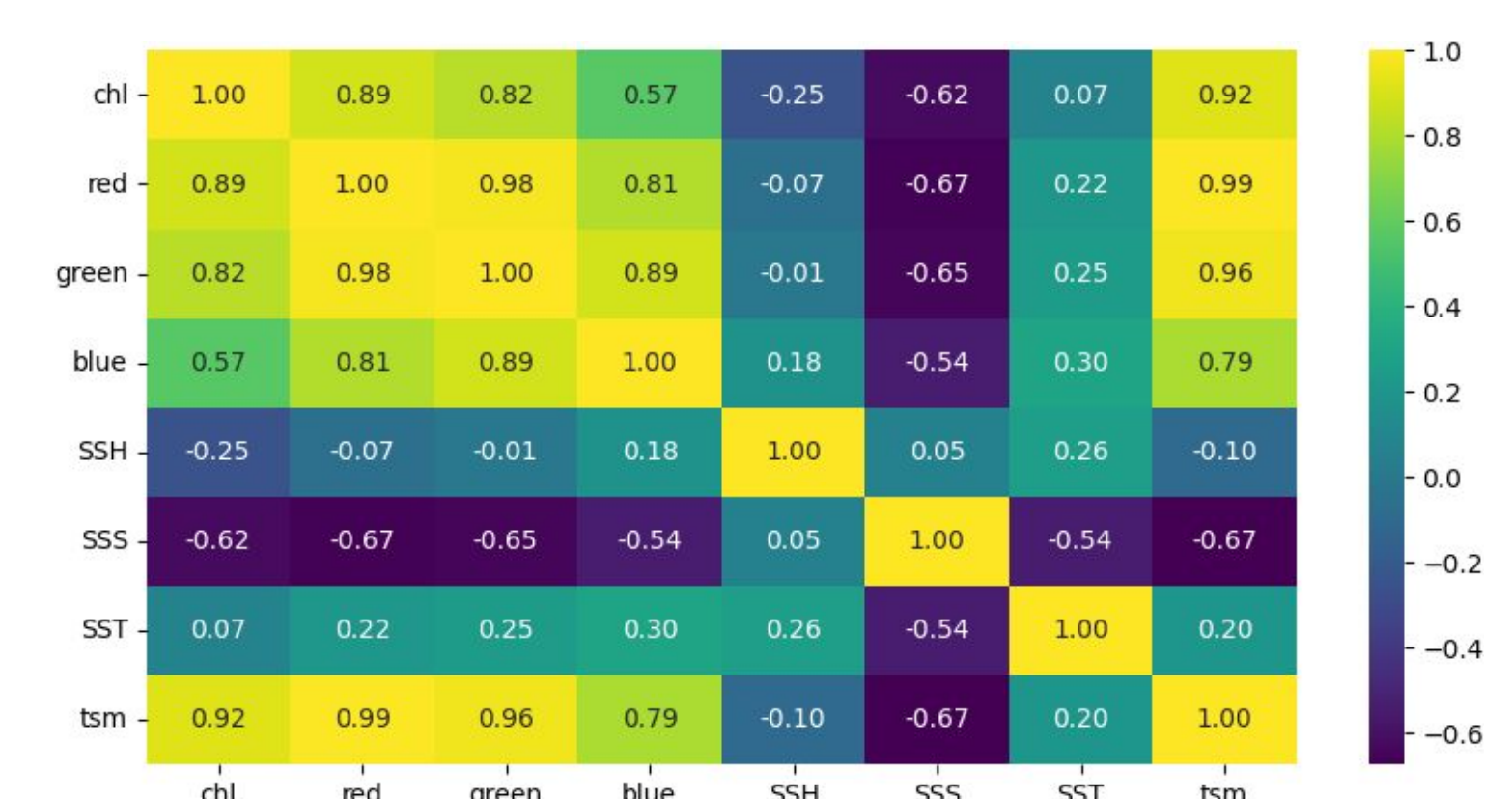


June 2023

### Correlation of Parameters



March 2023  
 $R^2 = 0.68$



June 2023  
 $R^2 = 0.89$

The **correlation** between chl-a and various parameters vary between the two periods. Correlation of visible bands and chl-a is **strong** and **significant** for both periods. However, higher with red and green bands.

## Conclusions

- Integration of machine learning and satellite imageries has shown a potential of carrying out **frequent** with **better accuracy** mapping for monitoring of water.
- Based on variations seen between the two periods, there is a need to use different **models** based on seasons to ensure **influencing climatic** and **environmental** factors are considered.

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