Statistical Estimation of the Saint John River Surface Water Quality Using Landsat8 Multi-spectral Data

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1. Introduction

- Water quality (WQ) refers to the chemical, physical, and biological characteristics of water.
- In the past few decades, WQ has been deteriorated due to human and non-human activities.
- Therefore, regular and continuous monitoring and assessing WQ is a major concern.

2. Research Problems

- The use of the Landsat TM/ETM and MODIS data has been used in previous studies; however, they are not from the recently launched earth observation satellite sensors.
- However, RS estimation of dissolved oxygen (DO) concentrations has not been performed.

3. Proposed Methodology

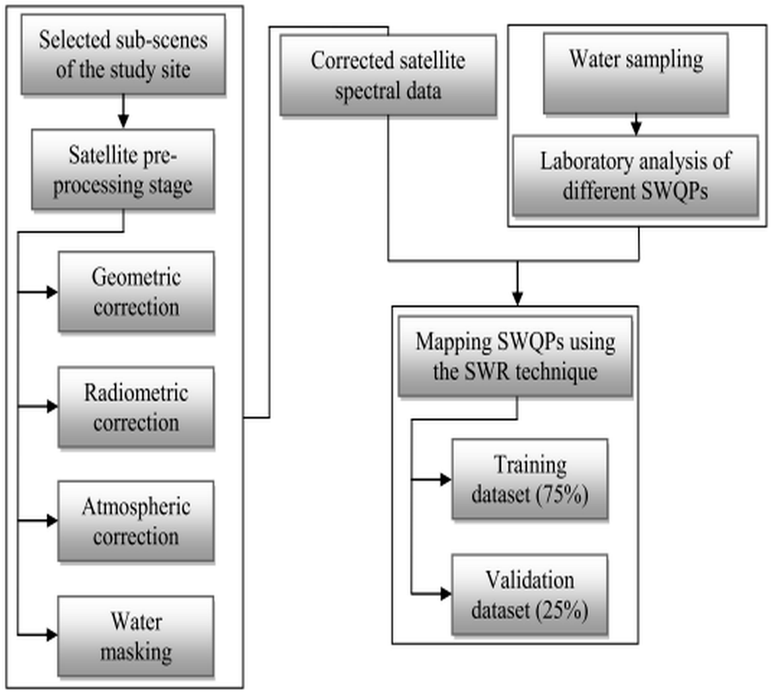

Fig. 1. The flow chart of the proposed method

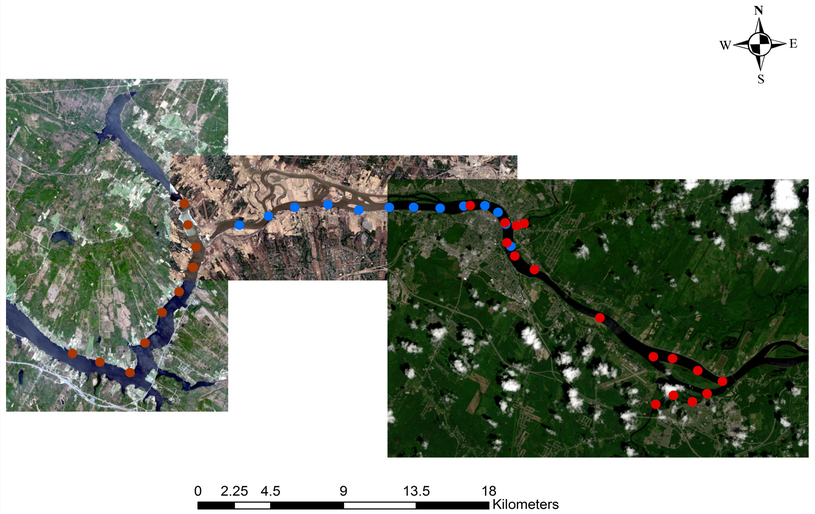

Fig. 2. The selected study site and water samples

4. Results

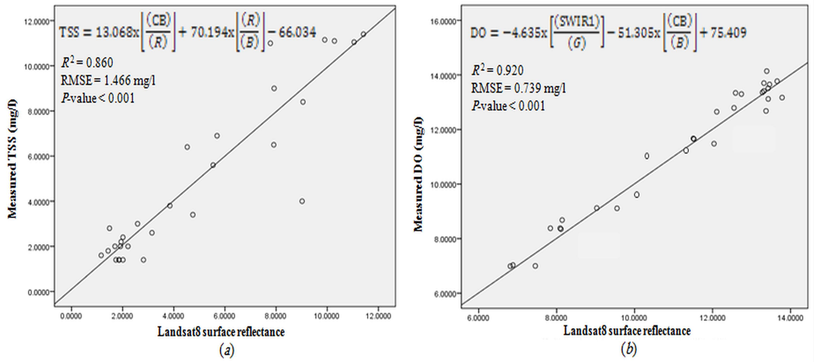

Fig. 3. Correlation between Landsat8 and TSS (*a*) and DO (*b*) based on calibration dataset

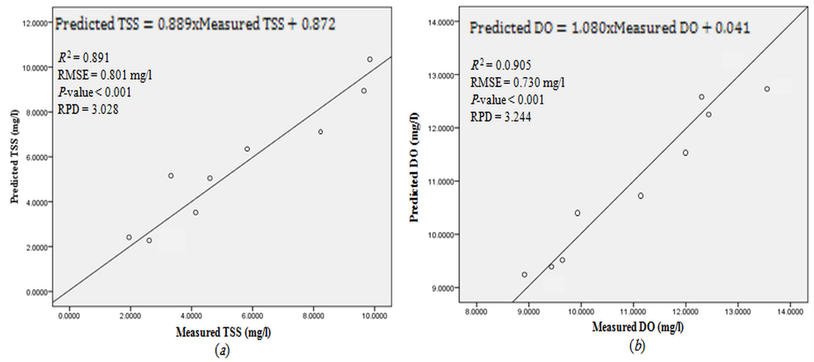

Fig. 4. Accuracy measures between measured and predicted concentrations of TSS (*a*) and DO (*b*) based on validation dataset

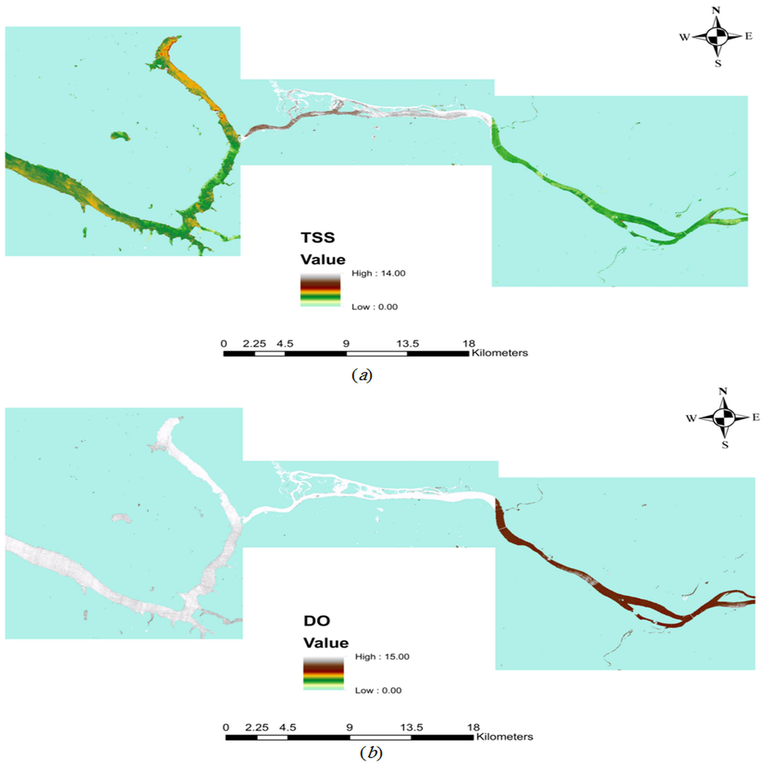

Fig. 5. Spatial concentration maps for TSS (*a*) and DO (*b*)

5. Conclusions

The Landsat8-based-SWR models could be obtained to retrieve concentrations of SWQPs with accurate results and the main bases are:

- Water sampling was performed at the same time of the Landsat8 over pass.
- Landsat8 spectral data is very efficient because its multi-spectral bands were designed to support coastal studies.
- The use of the Landsat8 surface reflectance is essential to represent only the water-leaving reflectance.

Acknowledgement

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