

# OCEAN OPTICS XXIV

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Tuesday, October 9

Poster Session 2

10:30–12:30

## Poster 194

### CLASSIFYING INLAND AND COASTAL WATERS USING PCA AND MULTINOMIAL LOGIT MODEL

Satellite Sentinel-3 provides us data sufficient enough for monitoring optically complex inland and coastal waters. Algorithms for predicting the amount of optically active substances (OAS) from the data are often failing because of the complexity of the waters. Algorithms applicable for some waters might not be suitable for others. Classifying waters prior to assessing the percentage of OAS in water makes it possible to determine the best algorithm for each of the measured spectra. In this study, reflectance spectra of waters are used to divide waters into 5 pre-defined types: Clear, Moderate, Turbid, Very turbid and Brown. First, principal component analysis (PCA) is used to reduce the dimensionality of the data. It emerges that 99% of the divergence in the data is describable with just the first four orthogonal principal components. Using these components as predictor variables in multinomial logistic regression, a model for predicting probabilities of a reflectance spectrum to belong to each of the 5 water types is created. Given that the water type with the highest probability is assigned as the predicted water type, over 80% of the spectra are classified correctly.

**Getter Põru**, Tartu Observatory, [getter.poru@gmail.com](mailto:getter.poru@gmail.com), <https://orcid.org/0000-0002-0520-3259>

Kristi Uudeberg, Tartu Observatory, [kristi.uudeberg@ut.ee](mailto:kristi.uudeberg@ut.ee)