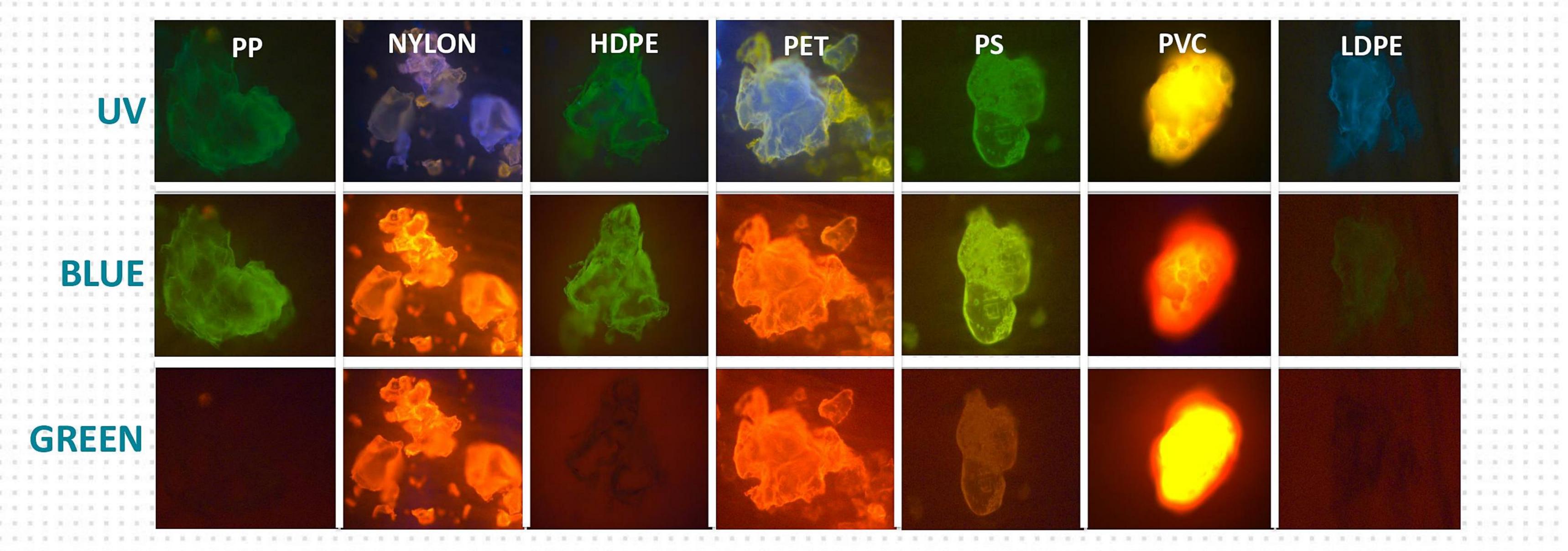
# A novel, automated method to identify microplastic polymers based on fluorescent staining with Nile Red

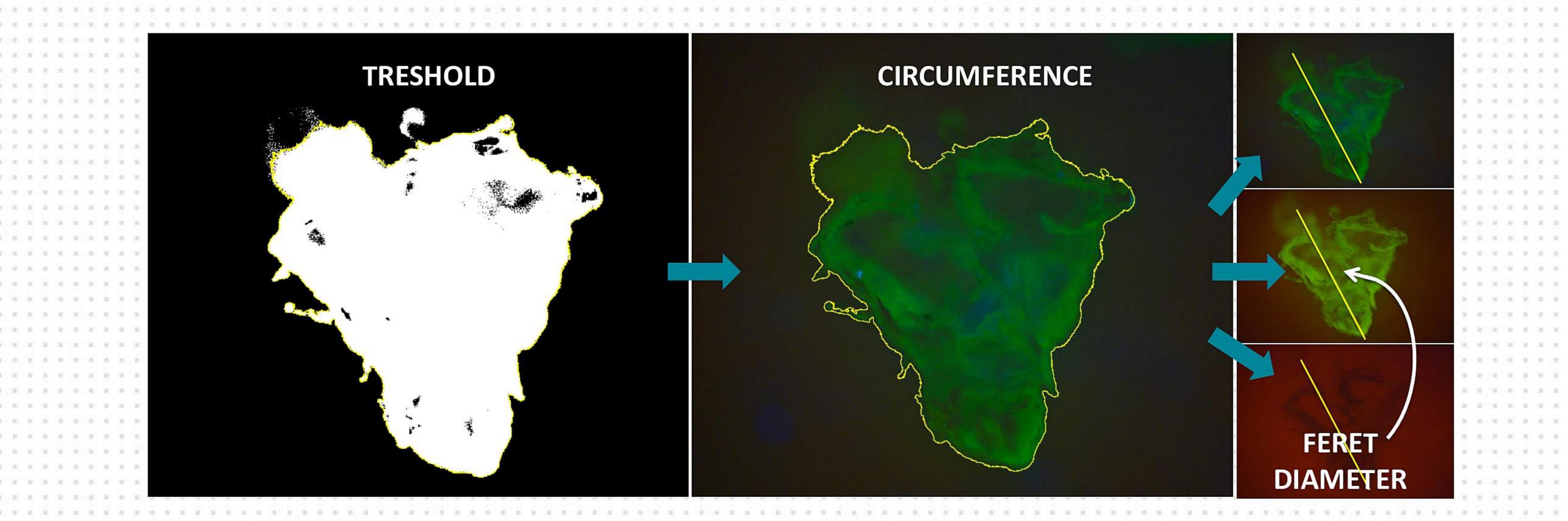
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### IRODUCTION

- \* There is an increasing concern about the microplastic levels in the marine environment and the associated risks for ecological and
- \* At both national and global levels, the demand for standardized, reliable protocols to monitor microplastics has risen.
- The widely used physical and chemical identification methods to assess plastics in the environment nowadays are often time consuming, expensive and subjective.

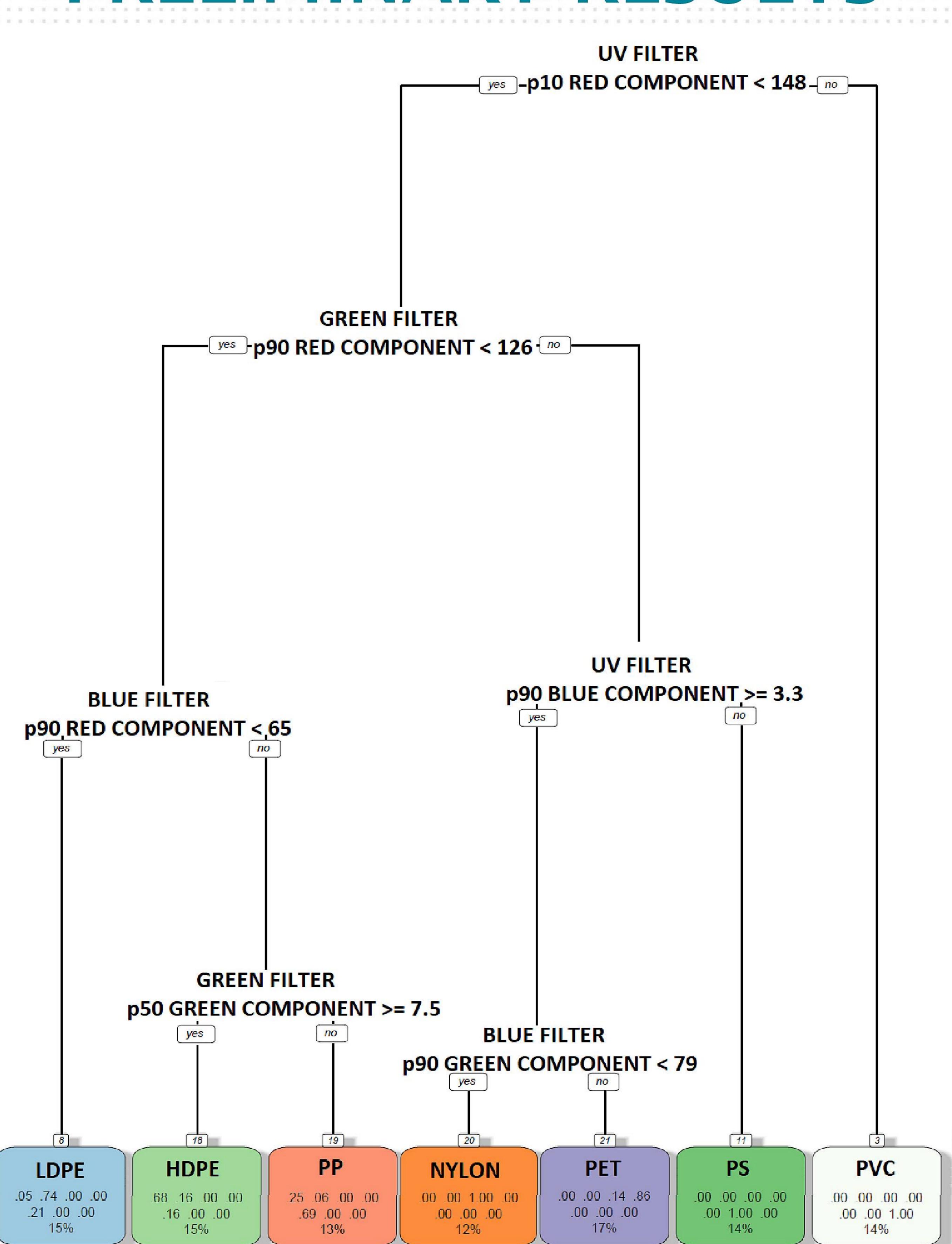




- We extracted RGB colour values of pixels along the Feret diameter of particles for each set of pictures in ImageJ.
- For each colour component we calculated the 10<sup>th</sup>, 50<sup>th</sup> and 90th percentile and the mean, and compiled this into a dataset.
- \* The dataset was then split into a training and test dataset, decision tree was constructed in R and its classification performance was tested.

## NEXT STEPS

- Enlarge training data set and develop validation data set.
- \*Test model robustness using artificially weathered plastics as a proxy for actual microplastics in the marine environment.



- The decision tree was constructed via an algorithmic app that identified predictor values according to which emission spectra data was split.
- The confusion matrix showed an accuracy of 92.86% and a Kappa-value of 0.92 (R package "caret"). This indicates an accurate identification of the polymers based on their
- There still is chance of polymers being misclassified, e.g. in the group 'PET' the probability of a correct classification is high (86%), but a low probability remains for Nylon to be







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