The underwater vegetation of the coastal zone has been studied in the Helsinki capital region with comparable methodology since the 1970s. The water framework directive (WFD) which was implemented in 2000 requires that new methodology is applied in the monitoring of underwater vegetation. In this study, the old contamination methodology is compared to the new WFD-compatible methodology based on ecological status classification of the water. This study was also a part of the monitoring of underwater vegetation carried out by the Helsinki Environment Centre.

In this study, the occurrence of submerged aquatic vegetation was studied in the summer of 2005 in the sea area stretching from Seurasaarenkilä to Katajaluoto. Twenty sampling sites were included, all situated on rocky and stony shores. With the rake method, a stretch of shoreline was studied to the depth of two meters, and with the diving method a line from the shoreline was mapped downwards to the depth where all vegetation ceased. Based on their vegetation, the areas were placed into classes which are used to describe the state of near-shore waters. The contamination methodology is based on the species composition and relative abundance of several indicator plants, while the WFD-derived ecological status classification at present is based solely on the lowest depth at which bladder wrack (Fucus vesiculosus) L. grows.

No significant improvements have occurred in the near shore aquatic vegetation compared to the previous monitoring study (1999) in either Seurasaarenkilä or the eastern shore of Lautasaari. Bladder wrack has not returned to the area, although several of the sampling sites would suit the species. The turbidity of the water impedes the growth of submerged macrophytes, and the high sedimentation of material derived from the water column prevents the attachment of small plants to the bottom. Internal loading weakens the status of the water in the area and maintains a high number of species which are indicators of eutrophication. The status of Vattuniemi was still worse than that of the other sampling sites on Lautasaari’s eastern shore. The aquatic vegetation of Lautasaarenkilä has remained only slightly disturbed or in natural state. Towards the outer archipelago area the aquatic vegetation indicates an improved state of the water; almost all the sampling sites were classed as in natural state. At the sampling sites in the Katajaluoto area the improvement in the state of the water is probably due to the reduced nutrient loading. Due to improvements in water purification technology, less nutrients, especially nitrogen, are released through the sewage tunnel.

Physical and chemical parameters are used to support the biological indicators in using the ecological status classification. One of the most important physical factors is the exposition of the shore which can be defined by estimating the effect of wind disturbance (fetch). Either of the statistical tests I used (the linear regression analysis and the Spearman’s ordinal correlation) gave statistical significance for more than one species; according to these tests only Cladophora glomerata (L.) Kütz. has negative correlation between the fetch and the structure of the vegetation (\( r^2 = 0.076, n = 69 \text{ ja } p = 0.022 \)). However, the variation in the structure of the C. glomerata is mostly explained with other factors than the fetch.

Fewer species were found using the rake method than by diving. According to the Friedman’s two-way variance analysis sampling method do has an effect on the contamination index (\( n = 20, df = 2 \text{ ja } p = 0.001 \)). A more positive picture of the status of the water was gotten with the diving method than with the rake method. The rake method is not intended for the study of species occurring at more than two meters’ depth, and thus not suited for determining the lowest depth at which bladder wrack occurs as the WFD requires. The diving method is suitable for both types of classification.

Based on this study, the ecological status classification gives on average a worse picture of the status of the water than the contamination method. When only one variable related to only one indicator species is used in the study as postulated in the WFD the result is limited, and does not necessarily give a true picture of the status of the water. It has been observed that the lowest growth depth of the bladder wrack clearly correlates with the eutrophication. That supports its use as the only parameter in the implementation of the WFD. The ecological classification of the state of the water cannot be applied to the inner bays due to the absence of bladder wrack, and the status of the water can there only be estimated using the contamination classification. However the use of the contamination classification is problematic: it’s not easy to define the indicator value of the species because there are several environment factors in addition to eutrophication that have an impact on the species.