

SEMINAR NOTICE: ALL WELCOME

The skeptical optimist: Challenges and perspectives for application of e-DNA for marine monitoring and fisheries management

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Abstract: Application of environmental DNA, "eDNA", for monitoring of marine organisms has recently attracted a lot of attention from researchers, advisors and managers of marine resources and biodiversity. The apparent simplicity and low price in comparison with traditional marine monitoring makes the method very attractive, as information on the presence and distribution of a number of species can be inferred from environmental samples – typically water. In addition, some studies have shown a very good correlation between the occurrence of species specific DNA in the sampled water and the number of individuals or biomass in the area. This finding provides hope that eDNA can be used in quantitative assessment of marine fisheries resources. However, the path from measuring DNA concentrations in the water to the establishment of reliable estimates of numbers and distribution of marine organisms is long and indirect, as it relies on a number of physical and biological factors which affect the generation, degradation and transport of eDNA in marine ecosystems. Here we provide an overview of the eDNA method, the most important processes that determine the abundance of DNA in marine water samples and their related uncertainties. We point to areas where there is an immediate need for more research and where e-DNA is not yet able to deliver in comparison with traditional marine monitoring. We suggest approaches to make eDNA analysis more reliable and present the newest technological achievements, which can make eDNA analysis more efficient. We still caution not to oversell the present applications of eDNA analysis, but believe that the method will be an integral part of future marine monitoring.