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Perspective

Radical Changes in Notions and Consequences for Monitoring Strategies for Coastal Eutrophication

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INTRODUCTION

Eutrophication is derived from two Greek words: 'eu' which indicates 'well' and 'trope' which means 'nutrition.' The contemporary definition of eutrophication refers to nutrient inputs and impacts in aquatic systems. Coastal eutrophication has no universally accepted term, despite widespread agreement on its causes and effects. Because primary production is a sensitive and accurate indication of eutrophication, it is recommended that measurements of organic carbon be made mandatory when monitoring and assessing the ecological status of coastal waters. For more than 30 years, eutrophication of coastal waters has been regarded as one of the most serious dangers to the health of marine ecosystems [1,2]. The European Union (EU) Water Framework Directive (WFD) was enacted by the European Parliament and the Council, and it establishes a framework for the protection of groundwater, inland surface waterways, transitional waters (estuaries), and shorelines. To support the long-term preservation and development of the aquatic environment by steadily reducing or eliminating pollutant discharges losses, and emissions, as well as other pressures. As a result, the directive might be considered the most important piece of legislation in terms of water policy in the previous 20 years, not only in Europe but also in non-European nations that use EU legislation as a model with their own laws.

What is the Definition of Eutrophication?

Within the EU, there is a long history of concentrating actions on the origins of eutrophication. As a result, eutrophication has been defined in terms of sources and/or industries. Eutrophication, for example, is defined as "the enrichment of water by nutrients, especially nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned" by the European Commission (EC). Nixon also mentions that while the increased supply of organic matter to coastal systems could be due to a variety of factors, nitrogen and phosphorus is undoubtedly one of them. Even if such an assumption leads to a practical operational definition, the supply of organic matter to an ecosystem is not limited to pelagic primary production. It also includes greater plant and benthic microalgae primary production, as well as organic material imports from nearby waterways or land, via rivers or point sources [3].

A Strategy for Process-Oriented Monitoring and Assessment

In general, monitor mode should be built around variables/indicators that reflect the state of each key quality element (biological (e.g. phytoplankton, submerged aquatic plants, and invertebrate benthic fauna), hydro morphological, or physiochemical) [4]. So far, there has been no discussion of particular monitoring recommendations as part of the pan-European process for developing a conceptual framework for eutrophication assessment. This will happen at a later point.

How do you Evaluate the State of the Environment?

The WFD requires EU member states to create classification systems that describe the ecological status of a specific water body at any given time [5]. Creating benchmark environment criteria with the goal of evaluating ecological quality against these standards is an important step in assessing ecological status. According to the WFD, an acceptable deviation is equivalent to high and good ecological status, with the above defined as a state in which the values of biological quality elements exhibit minimal degrees of distortion due to human activities.

CONCLUSION

Our goal is to establish a more exact interpretation of eutrophication that is linked to monitoring and assessment systems. Having to accept the above suggestions allows for a definition of eutrophication as "the enrichment of water by nutrients, particularly nitrogen and phosphorus and organic matter, causing an increase in the growth of algae and higher forms of plant life, resulting in an unacceptable deviation in the structure, function, and stability of organisms present in the water, and also in the quality of the water concerned, when compared to reference conditions." As a result, the future years will be a learning opportunity. The initiative can get off to a strong start with agreement on a pan-European definition of eutrophication and a focus on primary producers.

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