



Applied environmental micropaleontology and EU's Water Framework Directive

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In order to meet the requirements of EU's Water Framework Directive (WFD) for Transitional and Coastal Waters, there should be an increasing need for environmental micropaleontological expertise. Existing long-term biological monitoring data are limited both in space and time and do not provide the information needed for establishing the required "reference conditions". Environmental micropaleontology/geochemistry represents the best method available to obtain such data, even in areas where no previous monitoring has been carried out. Still, the guidance document concerning implementation strategy totally ignores the unique potential that retrospective marine micropaleontology and geochemistry represent.

A major challenge now is to make our governmental authorities aware of the potential micropalaeontology has to meet the directive's requirements, where traditional methods are insufficient. In order to make our methods attractive and applicable, we need to establish good ecological calibration sets and to improve our quantitative approaches. Improved knowledge of quantitative relationships between faunal/floral and environmental parameters is particularly needed. The Norwegian Pollution Control Authority's classification system for environmental quality includes a classification for soft-bottom macro-fauna. It is currently being modified and incorporated into the implementation strategy for WFD. We have applied this system to living (stained) as well as to fossil benthic foraminiferal assemblages in dated sediment cores from sill basins along the southern Norwegian coast. Distributional data show a significant correlation between several faunal parameters and annual dissolved oxygen minimum concentrations (bottom water). Application of the governmental classification system for environmental quality shows the same pattern whether used on soft-bottom macro-fauna or on benthic foraminifera. These ecological training sets have allowed recon-

struction of the successive environmental change (transition from one environmental class to another) within areas of different present-day environmental status.