

Multi-century reconstruction of environmental conditions in Lurefjorden, Norway

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Benthic foraminiferal assemblages are identified to reconstruct changes in environmental conditions over the last few centuries in Lurefjorden, a western Norwegian fjord. From ca. 1970 until present days the relative abundance of *Brizalina skagerrakensis*, an efficient bio-indicator for organic matter fluxes, is enhanced relative to the preceding time interval. Hence, our results suggest that there is an increase of the organic matter within the Lurefjorden basin in the last 50 years. Over the same period, there is also an increase in the absolute abundance of agglutinated species, indicating lower oxygen concentration in the water. A lowering of the oxygen concentrations may have taken place as a response of a greater oxygen consumption caused by a higher organic matter supply in the water column. According to Aksnes (2009), Lurefjorden was subject to an increased freshening of Norwegian coastal waters (NCW), which has led to a decrease in sunlight penetration into the water column, affecting the oxygen levels and the behavior of marine life within the basin, between 1935 and 2007. Furthermore, we used diversity indices to study the ecological status of the area, showing significant growth in diversity, abundance, and richness within the benthic foraminiferal community over the past 50 years. Our observations highlight that an increase in the input of organic matter over the last century has led to a change in the benthic foraminifera community in the Lurefjorden basin.

References

Aksnes DL, Dupont N, Staby A, Fiksen Ø, Kaartvedt S, Aure J (2009) Coastal water darkening and implications for mesopelagic regime shifts in Norwegian fjords. *Mar Ecol Prog Ser* 387:39-49.