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Radiolarian faunal turnover across the middle/late Eocene boundary at ODP Site 1052

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Radiolarian assemblages have been analyzed quantitatively using the samples of Ocean Drilling Program Site 1052 in the northwest Atlantic Ocean in order to determine the nature of the faunal turnover across the middle/late Eocene boundary. Two discrete extinction phases were recognized through the latest middle Eocene to early late Eocene (38.0 to 37.6 Ma and 37.2 to 36.5 Ma). The initiation of the extinction phase 1 coincides with first positive shift in planktonic foraminiferal??18O and relatively high radiolarian abundance. The second phase just above the middle/late Eocene boundary is associated with a significant drop in radiolarian diversity. We named these extinction phases Middle/Late Eocene Extinction (MLEE) Event.

Radiolarian assemblage changes indicate reduction of the paleo-Gulf Stream and enhancement of upwelling between 37.8 and 36.5 Ma, consistent with previously published faunal and floral assemblages and stable isotopes. The paleoceanographic changes in the North Atlantic Ocean might have triggered a severe cooling and major extinctions in the North America and Europe. The absence of typical deep-water species indicates the paleodepth of the Blake Nose was shallower than 1000 m during the middle Eocene.