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The making of sedimentary DNA: Insights from distribution patterns of DNA in sediments

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Sedimentary ancient DNA has by now become a recognized source of information on past biodiversity change, but our understanding of its dynamics and taphonomy is still limited. While for environmental DNA in water, dedicated investigations on its provenance and degradation are being increasingly carried out, we know very little about sedimentary DNA, in particular with respect to aquatic organisms. We are therefore conducting investigations on the distribution of DNA in surface sediments and a short sediment core, with a focus on aquatic communities in the large and heterogeneous Lake Constance. Targeted organisms range from phyto- and zooplankton to fish and waterbirds. Initial results and comparison with sightings of rare species indicate that the DNA is not distributed uniformly or widely across the lake, especially for multicellular animals, but rather linked to the local presence of the organisms. This has implications for our understanding of how DNA enters the sediment and for paleoecological inferences derived from these records.