



Mineralization of allochthonous organic carbon in lake sediments, from lake to landscape scale

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Lake sediments are well-recognized sites for the processing as well as sequestration of organic carbon. In particular boreal lake sediments have been recognized as important sites for the sequestration of organic carbon, comparable to soils or living biomass. Lakes in the boreal zone import large amounts of terrestrially derived organic carbon. Part of this organic carbon reaches the sediment surface through flocculation and sedimentation. The microbial processing of organic carbon represents one of the main factors that regulate the balance between sequestration of organic carbon and emission of green house gasses in boreal lake sediments. Recently, it has been shown a strong constrained microbial processing of allochthonous organic carbon in boreal lake sediments. However, a clear picture about the extent of the allochthonous organic carbon influence on the mineralization of sediment organic carbon in lakes and its significance at a large scale is currently lacking. We conducted a study, which explored the effect of allochthonous organic carbon on sediment organic carbon mineralization along a gradient of lakes characterized by increasing terrestrial organic carbon influence. We show a strong negative effect on sediment mineralization in lakes with increasing allochthonous organic carbon influence, which applies to a large number of lakes in the boreal zone.