



## **Calendar time scales for climatic records in lake sediments on the basis of radiocarbon dating**

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Radiocarbon dating is a method commonly used for constructing time scales for different climatic records of Late Pleistocene and Holocene. Dating of lake sediments, which often provide excellent evidence of climatic changes, requires preliminary recognition of material present in particular sediment, which determine the strategy for sampling, measurements and radiocarbon time scale construction. The age of a sediment sample should reflect the time of its deposition, and the most important issue is to identify this fraction of sediment, which would lead to reliable results and is present in sufficient quantity. Development of Accelerator Mass Spectrometry (AMS) technique enabled radiocarbon dating of samples containing 1 milligram of carbon or even less, which was of a great importance for lake studies. There are several factors that can influence the results of C-14 dating and the frequent one is so-called "reservoir effect", which usually results as apparent (older) age. In order to avoid this problem the measurements should be performed on organic material of terrestrial origin incorporated into sediment. Nowadays similar problems are usually solved by C-14 dating of terrestrial macrofossils, what can be achieved only by means of AMS technique. The example of such work carried out for Lake Wigry, Poland, will be presented, where the sediments are composed mostly by carbonates of relatively high apparent age. Radiocarbon age was determined for carbonate fraction of one short gravity core collected from upper part of sediments and for macrofossils from one long core. In some lakes the main problem constitutes scarcity of material suitable for dating, as the sediments can be very poor in organic matter and carbonates. One of such lakes is

Lake Baikal, Russia, and to solve this problem in frames of EU-Project CONTINENT much effort has been put in preparation and dating of high-purity sporomorph concentrates. Three sediment cores recovered from Lake Baikal were subjected to AMS radiocarbon dating. The construction of calendar time scale (age-depth model) was based on bayesian calibration of radiocarbon dates and use of statistical tools: linear regression and generalised additive models. Some advantages and disadvantages of these methods will be presented by above case-studies.